```
Copyright
GenCore version 5.1.6 (c) 1993 - 2004 Compugen Ltd.
```

protein search, using sw model

OM protein -

Run on: July 7, 2004, 08:46:10 ; Search time 59 Seconds (without alignments) 1431.893 Million cell updates/sec

Seguence: Title: Perfect score: US-10-007-521-12 1659

MRSTPVLRTTLAAALPLVAS.....TTCVSGTTCQKLNDYYSQCL 299

Scoring table: BLOSUM62 Gapop 10.0 , Gapext 0.5

Searched: 1586107 seqs, 282547505 residues

Total number of hits satisfying chosen parameters: 1586107

Minimum | Maximum | 留品 seq seq length: 0 length: 2000000000

Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries

A_Geneseq_29Jan04:*

Database :

8 2 5 5 4 3 2 1 geneseqp2002s:*
geneseqp2003as:*
geneseqp2003bs:* geneseqp1980s:*
geneseqp1990s:*
geneseqp2000s:* geneseqp2004s:* geneseqp2001s:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	% Query Match	Length	DB	¥	Description
ין	1659	100.0	299	2	AAW04928	Aaw04928 Cellulyti
2	1659	100.0	299	N	AAW63624	
ω	1178	71.0	305	N	AAW44854	Aaw44854 Humicola
d's	1178	4	305	N	AAW41929	Aaw41929 Humicola
Ųπ	1159	4	305	N	AAR15271	Aar15271 Humicola
σı	1159	69.9	305	N	AAR25428	Aar25428 Cellulase
-7	1159	69.9	305	N	AAR28295	Aar28295 Seguence
8	1159	69.9	305	N	AAR25525	Aar25525 Humicola
9	1159	69.9	305	N	AAR25464	Aar25464 Endogluca
10	1159	69.9	305	N	AAR27968	Aar27968 Endogluca
11	1159		305	N	AAR42063	Aar42063 Endogluca
12	1159		305	N	AAR37150	
13	1159	•	305	N	AAY67388	Aay67388 H. insole
14	1159	69.9	305	N	AAW01502	
15	1159	•	305	Ŋ	AAR88471	Aar88471 Alkaline
16	1159	69.9	305	N	AAW44266	Aaw44266 Humicola
17	1159	٠	305	N	AAW46616	Aaw46616 Humicola
18	1159	•	305	ω	AAB03660	Aab03660 Endogluca
19	1159	69.9	305	4	ABM00014	
20	1146		305	N	AAG78352	Aag78352 Humicola
21	1145	•	305	N	AAG78356	Aag78356 Humicola
22	1143	•	305	N	AAG78359	Aag78359 H. insole
23	1142.5	68.9	306	N	AAW44269	Aaw44269 Eybrid DN
24	1142	68.8	305	N	AAR28300	
25	1142	68.8	305	N	AAG78355	Aag78355 Humicola

45	44	43	42	41	40	Ę,	(J.) (F)	37	(A)	بيا نئ	(L) Ph	(L)	32	31	30	29	28	27	26
1107	1107.5	1108	1108	1110	1112	1112	1113	1114	1117	1119	1120	1122	1127	1134	1137	1137	1137	1138	1142
66.7	66.8	66.8	66.8	66.9	67.0	67.0	67.1	67.1	67.3	67.5	67.5	67.6	67.9	68.4	68.5	68.5	68.5	68.6	68.8
284	306	284	284	305	284	284	284	284	200	284	284	200	286	305	305	305	305	305	305
N	N	N	N	Ν	N	N	N	N	2	2	2	2	N	N	2	2	N	N	2
ABB04132	AAW44270	ABB04135	ABB04131	AAG78361	ABB04128	ABB04130	ABB04140	ABB04141	AAW53979	ABB04129	ABB04137	AAW53968	AAW57420	AAR28818	AAG78357	AAG78354	AAG78360	AAG78353	AAG78358
Abb04132	Aaw44270	Abb04135	Abb04131	Aag78361	Abb04128	Abb04130	Abb04140	Abb04141	Aaw53979	Abb04129	Abb04137	Aaw53968	Aaw57420	Aar28818	Aag78357	Aag78354	Aag78360	Aag78353	Aag78358
Mutant 43	Eybrid DN		Mutant 43	Humicola	Humicola	Mutant 43	Mutant 43	Humicola	Thielavia	Mutant 43	Mutant 43	Thielavia	Humicola	H. insole	Humicola	Humicola	Humicola	Humicola	Humicola

ALIGNMENTS

RESULT 1 AAW04928 ID AAWC 20-MAY-1997 AAW04928; AAW04928 standard; protein; 299 AA.

Cellulytic enzyme #4 of the invention.

(first entry)

Cellulytic enzyme; endoglucanase; hydrolysis; cellulose; microorganism; plant cellulase; catalytic region; textile; backstraining; bio-polishing; stone-washing; cellulosic fabric; colour clarification; defibration; cell wall degradation; paper pulp; debarking; fibre modification; enzymatic de-inking; drainage improvement.

Thielavia terrestris.

WO9629397-AL

26-SEP-1996.

18-MAR-1996;

96WO-DK000105

17-MAR-1995; 08-AUG-1995; 08-AUG-1995; 95DK-00000272

08-AUG-1995; 08-AUG-1995; 12-FEB-1996; 95DK-00000885. 95DK-00000886. 95DK-00000887. 95DK-00000888. 96DK-00000137.

(NOVO) NOVO-NORDISK AS.

Schuelein M, Nielsen RI, Andersen LN, Lass Ihara M, Takagi S; Lasser ŞĘ, Kauppinen MS. Lange L;

WPI; 1996-443173/44. N-PSDB; HAT39050.

New endo:glucanase enzyme preparations - contg. regions, useful for treating fabrics, textiles, conserved catalytic plant material or paper

Claim 72; Page 161-163; 316pp; English

AAW04925-W04932 represent the enzymes of the invention. These enzymes possess cellulytic (particularly endoglucanase) activity. Cellulytic enzymes are involved in the the hydrolysis of cellulose, and are

```
RESULT 2
AAW63624
AID AAW6
XX AAW6
XX AAW6
XX AAW6
XX MODO
XX MODO
XX MODO
XX MODO
XX MODO
XX Inie
XX 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            និនិនិនិនិនិនិនិនិ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    synthesised by a large number of microorganisms and plants. The enzymes of the invention containing the conserved catalytic regions (such as AAW04913) exhibit improved performance, go. 50 times higher performance, compared to multiple domain enzymes. The enzymes can be used for the treatment of fabrics or textiles, preferably for preventing backstaining, for bic-polishing or for stone-washing cellulosic fabric. They can also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAW63624 standard; protein; 299 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 299 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   be used to provide colour clarification for laundry. The enzymes can als be used for the degradation or modification of plant material, such as cell walls. They can also be used in the treatment of paper pulp preferably for debarking, defibration, fibre modification, enzymatic de-
                                Claim 16; Page 10-12; 16pp; English
                                                                                                                                                           N-PSDB; AAV39096.
                                                                                                                                                                                     WPI; 1998-263308/24.
                                                                                                                                                                                                                                                  Lund H,
                                                                                                                                                                                                                                                                                                                                                                                                                                       30-MAY-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   abraded looking jeans;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Monocomponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              21-SEP-1998
                                                                                             Pair of jeans - with abraded look.
                                                                                                                                                                                                                                                                                                               (NOVO ) NOVO-NORDISK AS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20-MAY-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Thielavia terrestris.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         inking or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        rocar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121 VAGKTMVVQSTSTGGDLGSNQFDLAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDS 18:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           គ្ន
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 MRSTEVLATTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LSDFNVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LSDFNVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSSSSWCCACYALTFTSGP 120
                                                                                                                                                                                                                                                  Kalum 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GIGIPTSTAPGSGQTSPGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EPAPLKPGCQWRFJWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFPVFTPPSGGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGTFNGCSSQFGGLPGAQYGGISSRDQCDS 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFPVFTPPSGGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      drainage improvement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                endoglucanase; cellulolytic enzyme; garment; abrasion;
ng jeans; fungus; Thielavia terrestris; stone-washed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              endoglucanase enzyme.
                                                                                                                                                                                                                                                                                                                                                                             96DK-00001276
                                                                                                                                                                                                                                                                                                                                                                                                                                       97EP-00610021.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 1659; DB 2;
Pred. No. 8.6e-119;
Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 299;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The enzymes can also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
```

```
ARMSHIT 3
ARMSH 20
AR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      몺
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8888888888888888888888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CC This represents a monocomponent endoglucanase. This is a cellulolytic CC enzyme belonging to the fungal species Thielavia terrestris. This can be CC used in the process of invention of providing a pair of jeans made from CC dyed twill fabric that has localised variations in the colour density of Cthe fabric. The process involves providing the jeans with a stone-washed CC or abraded look, where the variation corresponds to a delta remission CC value (Delta R) higher than 11, and the reflection of a first area of the jeans fabric is less than 12 percent. The process comprises selecting the CC desired textile cutting pattern for jeans garment, positioning the CC desired textile cutting pattern for jeans garment, positioning the CC pattern onto newly manufactured dyed twill fabric, cutting the jeans CC garment parts, sowing the pair of jeans, optionally subjecting the pair CC of jeans to a desizing treatment, and subjecting the pair of jeans to an aqueous medium essentially free of bleaching chemicals. The abraded CC look near stitching is different from the abraded look far from stitching
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
Matches 299; Conserv
                                  24-JUL-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Humicola insolens cellulase NCE4 protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       31-JUL-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAW44854 standard; protein; 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 299
                                                                                               24-JUL-1997;
                                                                                                                                                                                                                                W09803667-A1
                                                                                                                                                                                                                                                                                                                               Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Humicola insolens; NCE1; NCE2; NCE4; cellulase; promoter; signal sequence; terminator; amylase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Humicola insolens.
                                                                                                                                                                                                                                                                                                                                                                                            Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTGTPTSTAPGSGQTSPGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FPAPLKPGCQWRFDWFQNADNPTETFQQVQCPAEIVARSGCKRNDDSSFPVFTPPSGGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VAGKIMVVQSTSTSGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDS 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LISDENVQSGCNGGSAYSCADQTPWAVNDNLAYGEAATSTAGGSESSWCCACYALTETSGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LSDFNVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGF 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GTGTPTSTAPGSGQTSPGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFPVFTPPSGGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AA;
                                     96JP-00195070
                                                                                                  97WO-JP002560
                                                                                                                                                                                                                                                                                                 22. .305
/label=
                                                                                                                                                                                                                                                                                                                        /label= signal
22. .305
                                                                                                                                                                                                                                                                                                                                                                                                                           Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    100.0%; Score 1659; DB 2;
100.0%; Pred. No. 0.6e-119;
ative °; Mismatches 0;
                                                                                                                                                                                                                                                                                             Cellulase_NCE4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        expression vector; lipase; protease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 299;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
```

Moriya :

```
Matches 209;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCE2). The vector also contains a marker gene such as an antibiotic resistance gene (e.g. the destomycir resistance gene from Streptomyces rimofaciens). Proteins which can be expressed using this system include cellulase, amylase, lipase, protease, phytase and other enzymes. Specific expression vectors of the invention are pMXDD1 (for Humicola NCE3 cellulase gene), pEGD01 (for Humicola NCE4 cellulase gene) and pIED02 (for Humicola NCE4 cellulase gene) and proteins and peptides in a Humicola host. Using the expression system allows the appreciation of proteins and peptides in a Humicola host.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mass production of proteins and peptides in Humicola species - using expression vector containing the promoter, signal sequence and/or terminator from the Humicola insolens NCB1 or NCB2 gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 305 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        which comprises the promoter, signal sequence and/or terminator regulatory sequences from the NCE1 or NCE2 gene of H. insolens. These are available in the plasmids pM-1 (Escherichia coli JM109/pM3-1, FERM BP-5971) (for NCE1) and pM14-1 (E. coli JM109/pM14-1, FERM BP-5972) (for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            method for the mass production of proteins and peptides in Humicola species, especially in Humicola insolens, using an expression vector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Example A6; Page 46-48; 63pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protein from
            Humicola insolens endoglucanase cellulase NCE4.
                                                      26-JUN-1998
                                                                                               AAW41923;
                                                                                                                                      AAW41929 standard; protein; 305 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       The present sequence represents the Humicola insolens cellulase NCE4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (MBIJ ) MEIJI SEIKA KAISHA LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1998-120786/11.
                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     120 PVAGKTMVVQSTSTGGDLGSNQFDIAXEGGGVGIFNGCSSQEGGLFGAQYGGISSRDQCD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LSDENVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSBSSWCCACYALTETSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MRSSPLLRSAVVAALPVLALAA--DGKSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MRSTPVLRTILAAALELVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANEGR
                                                                                                                                                                                                                                                                                  DYYSQCL 299
                                                                                                                                                                                                                                                                                                                       SSPYGQPTSTSTSTSTSSPPYQPTTPSGCTAERWAQCGENGWSGCTTCVAGSTCTKIN
                                                                                                                                                                                                                                                                                                                                                                  NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGEGFSGCTTCVSGTTCQKLN
                                                                                                                                                                                                                                                                                                                                                                                                           REPDALKPGCYWREDWEKNADNESESERQVQCPAELVARTGCRRNDDGNEPAVQIPSSST
                                                                                                                                                                                                                                                                                                                                                                                                                                                SFPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFP-VFTPPSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PVAGKKMVVQSTSTGGDLGSNHEDLNIEGGGVGIFDGCTPQFGGLFGQFX3SISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LIDEDAKSGCEPGGVAYSCADQIPWAVNDDFAFGFAATSIAGSNEAGWCCACYELTETSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Murashima K,
ono T, Murak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the present
                                                      (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           71.0%; Score 1178; DB 2; Length 305; 68.1%; Pred. No. 5.1e-82; tive 44; Mismatches 44; Indels 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Aoyagi K,
ami T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sumida
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The present invention describes a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Watanabe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ₹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hamaya
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             H
                                                                                                                                                                                                                                                                                                                                                                                                                                                    238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             58
                                                                                                                                                                                                                                                                                                                                                                                                             238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    119
                                                                           RESULT 5
AAR15271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                맑
                                                                                                                                                                                                                                                                                                                           당
                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .<del>Q</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
S & & S
                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                  Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches 209; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Endoglucanase; cellulase; NCE4; fluff removal; weight reduction; denier reduction; bleaching; denim dyed fibre.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The present sequence is the Humicola insolens endoglucanase cellulase NCEA, which can be used to treat cellulose fibres for fluff removal, weight (denier) reduction and bleaching, especially of denim dyed fibres
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Murashima K,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     24-JUL-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WO9803640-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Humicola insolens.
                   AAR15271;
                                                          AAR15271 standard; protein; 305 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 305 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 1; Page 33-36; 43pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Endoglucanase cellulase NCE4 from Humicola insolens - for treatment of cellulose fibres for fluff elimination and weight reduction.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N-PSDB; AAV13840.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPI; 1998-120765/11.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Murakami T,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              24-JUL-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (MEIJ ) MBIJI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local Similarity
                                                                                                                                                             299
                                                                                                                                                                                                    293
                                                                                                                                                                                                                                           239 SSPVGQPTSTSTSTSTSSPPVQPTTPSGCTAERWAQCGGNGWGSCTTCVAGSTCTKIN
                                                                                                                                                                                                                                                                       239 NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                179 REPDALKEGCYWREDWEKNADNESESEROVOCEAELWARTGCRRNDDGNEPAVQIESSST
                                                                                                                                                                                                                                                                                                                                                     180 SEPAPLKPGCQWRFDWFQNADNDFTETFQQVQCPAEIVARSGCKRNDDSSFP-VFTPPSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                119
                                                                                                                                                                                                                                                                                                                                                                                                                                          120 PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                59 LTDFDAKSGCEPGGVAYSCADQTPWAVNDDFAFGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 MRSTEVIRTTLAAALEIVASAASGSGQSTRYWDCCKESCAWEGKAAVSQEVYACDANEQR
                                                                                                                                                             DWYHQCL 305
                                                                                                                                                                                                    DYYSOCL 299
                                                                                                                                                                                                                                                                                                                                                                                                             PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LSDFNVQSGCN-GGSAYSCADQTFWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MRSSPLLRSAVVAALPVLALAA--DGKSTRYMDCCKPSCGWAKKAPVNQPVESCNANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Moriya T,
Kono T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEIKA KAISHA LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              96JP-00194974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       97WO-JP002561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23. .305
/label= mat_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label= sig_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   71.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Hamaya T,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             44; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 1178; DB 2;
Pred. No. 5.1e-82;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Koga J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sumida N,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Aoyagı
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ×
```

က် ထ

60

178

238

118 119

RESULT 4
AAW41929
ID AAW4
XX
AC AAW4
XX
DT 26-C
XX
DE Humi
XX

Š. 밁 á 닭 Ś 멍

119

52

179

Ŋ 멍 Ş В

```
Ω¥.
                                                                                                                                                Q
                                                                                                                                                                           ď
밁
                                         밁
                                                          Ś
                                                                                    B
                                                                                                        Ş
                                                                                                                               밁
                                                                                                                                                                                              Ş
                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                             The cellulase isolated from H.insolens has mol.wt. ca. 43kD by SDS-PAGE and an iscelectric point of ca. 5.1. The enzyme can be used in detergents for softening, soil removal and colour clarification. It can reduce the harshness of cellulose-contg. fabrics. (Updated on 25-MAR-2003 to correct
                                                                                                                                                                                                                                                                                                                                                                                                     Claim 6;
                                                                                                                                                                                                                                                                                                                                                                                                                        Cellulase prepn. comprising endoglucanase enzyme - used in detergents cellulose-contg. fabrics or to improve drainage of paper pulp.
                                                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 1991-353765/48.
N-PSDB; AAQ14856.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hjort
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rasmussen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 09-MAY-1990;
22-APR-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 09-MAY-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NO9117243-A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cellulase; cellulose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Humicola insolens DSM 1800 endoglucanase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25-MAR-2003
18-FEB-1992
                                                                                                                                                                                                                                                                                                              Sequence 305 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        14-NOV-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Humicola
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (NOVO ) NOVO-NORDISK AS
                                                                                                                                                                                                                                                                  Local Similarity
nes 206; Conserv
 299
                      293
                                         239
                                                               239
                                                                                       179
                                                                                                         180
                                                                                                                                 119
                                                                                                                                             120 PVAGKTMVVQSTSTGGDLGSNQFDLAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                                                                                                                                                                            59
                                                                                                                                                                                                 6
                                                                                                                                                                                                                                            ы
 DWYHQCL 305
                                         SSPVNQPTSTSTTSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN
                                                           NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLN
                                                                                                         STPAPLKPGCOWREDWEONADMPTFTFQQVQCPAEIVARSGCKRNDDSSFP-VFTPPSGG 238
                                                                                                                               PVAGKKMVVQSTSTGGDLGSNHEDLNIEGGGVGIEDGCTPQEGGLEQGXXGGISSRNECD
                                                                                                                                                                            ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                          LSDENVÇSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTETSG
                                                                                                                                                                                                                                    MRSTPYLRTILAAALPLYASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPYYACDANFQR
                                                                                                                                                                                                                                                                                                                                                                                                    Page 48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          n G, Mikkel:
Hastrup S;
                      DYYSQCL
                                                                                                                                                                                                                        MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    insolens.
                                                                                       REPDALKPGCYWREDWEKNADNESESERQVQCPAELVARTGCRRNDDGNEEAVQIESSST
                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (revised)
(first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mikkelsen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 90DK-00001159.
91DK-00000736.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 90DK-00001159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22. .305
/label= endogiucanase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label= signal
22. .305
                      299
                                                                                                                                                                                                                                                                                                                                                                                                  67pp;
                                                                                                                                                                                                                                                                             69.9%;
                                                                                                                                                                                                                                                                                                                                                                                                    English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ä,
                                                                                                                                                                                                                                                                  44;
                                                                                                                                                                                                                                                                            Score 1159; DB 2;
Pred. No. 1.4e-80;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Schulein M,
                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Patkar SA,
                                                                                                                                                                                                                                                                   47;
                                                                                                                                                                                                                                                                                        Length 305;
                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hagen
                                                                                                                                                                                                                                                                   10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       벌
                                                                                                                                   178
                                                                                                                                                                              118
                                                                                                                                                                                                                        58
                                                                                                                                                                                                                                             65
                                                                                                                                                                                                                                                                                                                                                                                                                                      for
                                             298
                                                                                       238
                                                                                                                       밁
                                                                                                                                                                  밁
        8
                                 망
                                                     Ś
                                                                                               8
                                                                                                                                           8
                                                                            片
```

```
RESULT 6
AARZ5428
ID AARZ
AC AARZ
AC AARZ
AC AARZ
AC AARZ
AC COLID
DT 25-A
DT 25-A
DT 25-A
DT 15-C
DT 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The cellulase was used in a detergent compsn. contg. a quaternary ammonium cpd. The compsn. gives a detergent with good cleaning and softening performance due to the synergistic effect of the ammonium and cellulase components. The cellulase is a homogeneous endoglucanase componant which is immunoreactive with an antibody raised against a cellulase purified from Humicola isolens DSM 1800. See also AAR25429. (Updated on 27-AMG-2003 to correct PN field.) (Updated on 27-AMG-2003 to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 305 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          correct OS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Detergent compsn. for in quat, ammonium cpd. and endo:glucanase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  16-JAN-1991;
06-NOV-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Humícola insolens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Endoglucanase; immunoreactive; Humicola isolens; cleaning; softening
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Cellulase contained in a detergent compsn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15-JAN-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           27-AUG-2003
25-MAR-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAR25428;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAR25428 standard; protein; 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 10; Page 19; 28pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WPI; 1992-243405/30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Convents AC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15-JAN-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22-JUL-1992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EP495554-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (PROC ) PROCTER & GAMBLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local
                                                                                                                                                                                                                            119
                                                                                                                                                                                                                                                                          120 PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    206;
                                                                                                                                                                                                                                                                                                                                                 59 ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                             61 LSDENVQSGCN-GGSAYSCADQTFWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 MRSTPVLKTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDAWFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
SSPVNQPTSTSTTSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN
                                                 NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQXWAQCGGTGFSGCTTCVSGTTCQKLN
                                                                                                              RFDDALKPGCYWRFDWFKNADNESFSFRQVQCEAELVARTGCRRNDDGNFPAVQIPSSST
                                                                                                                                                         SEPAPLKPGCQWREDWFQNADNETETFQQVQCPAEIVARSGCKRNDDSSFP-VFTPPSGG
                                                                                                                                                                                                                                PVAGKOMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                field.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (revised)
(revised)
(first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Busch A,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  91EP-00870006
91EP-00202881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        92EP-00200101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for improving cleaning and performance - is co
1. and high activity cellulose e.g. homogeneous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                69.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Baeck
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 1159; DB 2;
Pred. No. 1.4e-80;
14; Mismatches 47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   composed
                                                                292
                                                                                                                       238
                                                                                                                                                                              23.6
                                                                                                                                                                                                                                         178
                                                                                                                                                                                                                                                                                                179
                                                                                                                                                                                                                                                                                                                                                                                                              119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
      298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ဇ္
```

```
RESULT 7
AAR28295
                                                                                                                                                                                        Q
문원
                                           멍
                                                               5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                          믕
                                                                                                            8
                                                                                                                                                    Query Match
Best Local (
                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                               Detergent additive contg. cellulase and specific protease - which does not degrade the cellulase during storage and clarifies the colour of dyed cellulosic materials.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAR28295;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAR28295
                                                                                                                                                                                                           The ..43 kD endoglucanase derived from Humicola insolens, DSM 1800 is described in detail in co-pending Danish patent application No. DK 1159/90. As a detergent additive, it has a higher degree of specificity then Bacillus lentus serine protease. The term "higher degree of specificity" is defined as a protease which conditions degrades human insulin to fewer components. (Updated on 25-MAR-2003 to correct PN field.) (Updated on 24-OCT-2003 to standardise OS field)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    10-APR-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Humicola
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Detergent addative; protease; enzyme; endoglucanase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        02-APR-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24-OCT-2003
25-MAR-2003
                                                                                                                                                                                                                                                                                                                                                                                                                Wagner P,
                                                                                                                                                                                                                                                                                                                                                                                                                                                            22-APR-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29-CCT-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WC9218599-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Peptide
                                                                                                                                                                                       Sequence 305 AA;
                                                                                                                                                                                                                                                                                                        Disclosure; Page 8-9; 15pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                      (NOVO ) NOVO-NORDISK AS
                                                                                                                                                                                                                                                                                                                                                                                         1992-382092/46.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              293
119
                      120
                                                                                                                                         206;
                                             59
                                                                   61 LSDFNVQSGCN-GGSAYSCADQTFWAVNDNLAYGFAATSIAGGSESSWCCACYALTETSG
                                                                                                                 1 MRSTPWIRTTLAAALPIVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR
                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           standard; protein; 305 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DWYHQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DYYSQCL
             PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  insolens;
 PVAGKKWVVQSTSTGGDLGSNHFDLNIPGGGVG1FDGCTPQFGGLPGQRYGGISSRNECD
                                             ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTETSG
                                                                                            MRSSPILLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFOR
                                                                                                                                                                                                                                                                                                                                                                                                               Tsuchiya R;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1
                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (revised)
(revised)
(first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                43 kD endogulcanase
                                                                                                                                                                                                                                                                                                                                                                                                                                                            91DK-00000737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    92WO-DK000116.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1. .21
/label= signal
22. .305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DSM 1800.
                                                                                                                                                    69.9%;
                                                                                                                                        44;
                                                                                                                                        Score 1159; DB 2;
Pred. No. 1.4e-80;
4; Mismatches 47
                                                                                                                                                               Length 305;
                                                                                                                                            Indels
                                                                                                                                         10;
                                                                                                                                          Gaps
                                                                    119
  178
                       179
                                             118
                                                                                            58
                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ₽,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ś
            Ś
                                               Query Match
Best Local
                                    Matches 206;
```

```
RESULT 8
AAR25525
뮹
                     The endoglucanase isolated from H.insolens DSM 1800 has Mr 43,000 and high cellulase activity (i.e. removes a minimum of 10% of radiolabelled carboxymethylcellulose (C14CMC)). The enzyme can be used in detergent compositions along with a surface active agent, a builder system and a softening clay. See also AAQ26407. (Updated on 25-MAR-2003 to correct PN field.) (Updated on 24-OCT-2003 to standardise OS field)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      24-OCT-2003
25-MAR-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Detergent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAR25525;
Sequence 305 AA;
                                                                                                               Claim 5; Page 29-30; 38pp; English.
                                                                                                                                                 Compact, granular detergent compsns. - contain high activity cellulase and softening clay to provide synergistic effect in softening
                                                                                                                                                                                         WPI; 1992-243163/30.
N-PSDB; AAQ26405.
                                                                                                                                                                                                                                  Convents
                                                                                                                                                                                                                                                                                    16-JAN-1991;
                                                                                                                                                                                                                                                                                                            06-NOV-1991;
                                                                                                                                                                                                                                                                                                                                                              EP495258-A1
                                                                                                                                                                                                                                                                                                                                                                                                     Protein
                                                                                                                                                                                                                                                                                                                                                                                                                          Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                         ě
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Humicola
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Humicola insclers DSM 1800 endoglucanase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          11-JAN-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAR25525
                                                                                                                                         performance.
                                                                                                                                                                                                                                                         (PROC ) PROCTER & GAMBLE CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              flocculation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            293
                                                                                                                                                                                                                                ÃC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SFPARIXPGCQWREDWFQNADNPTETFQQVQCPAEIVARSGCKRNDDSSFP-VETFPSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   insolens; DSM 1800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    standard; protein; 305 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DYYSOCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SSPVNQPTSTSTTSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REPDALKPGCYWREDWEKNADNPSESERQVQCPAELVARTGCRRNDDGNEPAVQIPSSST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DWYHQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           washing powder; cellulase; softening clay; C14CMC-method; on; radio-labelled carboxymethylcellulase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         {revised}
{first en
                                                                                                                                                                                                                                Busch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   revised
                                                                                                                                                                                                                                                                                    91EP-00870006
                                                                                                                                                                                                                                                                                                            91EP-00202880.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     305
                                                                                                                                                                                                                                                                                                                                                                                      /label= endoglucanase
                                                                                                                                                                                                                                                                                                                                                                                                                /label= sigmal
                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             299
                                                                                                                                                                                                                                Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          entry)
                                                                                                                                                                                                                                                                                                                                                                                                     .305
                                                                                                                                                                                                                                  Baeck AC;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    236
```

Local Similarity

69.9%; milarity 67.1%; Conservative 4

9%; Score 1159; DE 1%; Pred. No. 1.4e-44; Mismatches

DB 2; [.4e-80; les 47;

Length 305; Indels

107

Gaps

4

6

Ś

岁 Q 밁 S 문 Ş 문

밁 S 뫄

299 293 239 239 179 180 119 120 59 61

AAR25464; AAR25464

298

238

179 118 119 58 60

178 238

```
The sequences given in AAR25464 and AAR25466 are endoglucanases which are immunoreactive with a monoclonal antibody raised against a partially purified 43 kD cellulase derived from Humicola insolens. These endoglucanases exhibit a CMC-endoase activity of at least about 50, pref. at least about 60, inparticular at least about 90 CMC- endoase units per mg of total protein. These endoglucanases have molecular weight of approx. 43 kD. (Updated on 25-MAR-2003 to correct DN field.) (Updated on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          25-MAR-2003
07-JAN-1993
                                                                                                                                                                                     Compact, granular detergent compsns. - contain high activity cellulase and softening clay to provide synergistic effect in softening
                                                                                                                                                                                                                                     WPI; 1992-243162/30.
N-PSDB; AAQ26380.
                                                                                                                                                                                                                                                                                                                                                                             1991;
                                                                                                                                                                                                                                                                                                                                                                                                          22-JUL-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                         EP495257-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CMC-endoase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Endoglucanase
                                                                                                                                       Disclosure; Page 20-21; 29pp; English
                                                                                                                                                                                                                                                                                                                                               16-JAN-1991;
                                                                                                                                                                                                                                                                                                                 (PROC ) PROCTER & GAMBLE CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   insolens.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SFPAPIKPGCOMREDWEONADNETETEQQVQCPAEIVARSGCKRNDDSSFP-VFTPPSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LSDFNVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NGGTGTFTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLN;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SSPVNQPTSTSTTSTTSSPPVQPTTPSGCTAERWAQCGGNGNSGCTTCVAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2VAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DWYHQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RFFDALKPGCYWRFDWFKNADWPSFSFRQVQCPAELVARTGCRRNDDGNFPAVQIPSSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                                                                                 Busch A,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              43 kD cellulase; monoclonal antibody.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (revised)
(first entry)
                                                                                                                                                                                                                                                                                                                                               91EP-00870006
                                                                                                                                                                                                                                                                                                                                                                             91EP-00202879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= Signal_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /label= Mature_protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein;
                                                                                                                                                                                                                                                                                    Ceulemans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         305
                                                                                                                                                                                                                                                                                    RAA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         β
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 10
AAR27968
           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 X &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       24-OCT-2003
25-MAR-2003
09-MAR-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 305 AA;
                     Laundry detergent compsns. - contg. alkali cellulase colour maintenance upon laundering.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAR27968;
                                                                   N-PSDB;
                                                                                                               Busch A,
                                                                                                                                                                             12-APR-1991;
                                                                                                                                                                                                           07-APR-1992;
                                                                                                                                                                                                                                                                                                                 Peptide
                                                                                                                                                                                                                                                                                                                                                                Key
                                                                                                                                                                                                                                                                                                                                                                                               Humicola
                                                                                                                                                                                                                                                                                                                                                                                                                              fabric
                                                                                                                                                                                                                                                                                                                                                                                                                                           Alkaline cellulase; laundry detergent compositions;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Endoglucanase enzyme.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAR27968 standard; protein; 305 AA.
                                                                                    WPI; 1992-341667/42.
                                                                                                                                                                                                                                          14-OCT-1992
                                                                                                                                                                                                                                                                      32508358-A1
                                                                                                                                                                                                                                                                                                                                                Peptide
                                                                                                                                                (PROC )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61 LSDFNVQSGCN-GGSAYSCADQTFWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         μ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 MRSTPVIRTTLAAALPIVASAASGSGQSTRYMDCCKPSCAMPGKAAVSQPVYACDANPQR
                                                                                                                                                                                                                                                                                                                                                                                                                              colour
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                     AAQ29934
                                                                                                                                                PROCTER & GAMBLE CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEPAPIKEGCOMREDWEQNADNETTETEQQVQCPAEIVARSGCKRNDDSSEP-VETPESGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIENGCSSQFGGLPGAQYGGISSRDQCD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                                                                                                                                                                                              insolens: DSM 1800.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SSPVNQPTSTSTTSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REPDALKPGCYWREDWEKNADNESESERQVQCEAELVARTGCRRNDDGNEDAVQIPSSST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLFGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGPAATSIAGSNBAGWCCACYELTFTSG
                                                                                                                 Maccorquodale
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (revised)
(revised)
(first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                              maintenance.
                                                                                                                                                                              91EP-00870062
                                                                                                                                                                                                           92EP-00105956
                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                  /note= "signal peptide"
                                                                                                                                                                                                                                                                                                   /note= "mature peptide"
                                                                                                                                                                                                                                                                                                                      .305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69.9%; Score 1159; DB 2; 67.1%; 2red. No. 1.4e-80;
                                                                                                                  'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                          and PVP for fabric
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
```

Humicola

Protein Peptide

Baeck AC,

```
ARASULT 11
AAA42063
ID AAA422
XX AAA42
XX AAA42
XX Detea
XX Detea
XX Humic

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      đ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8 x 6 6 6 6 6 6 6 8 x 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The sequence is that of an endoglucanase (alkaline cellulase) from Humicola insolens which is used with a polyvinylpyrrolldone (PVP) in a laundry detergent compsn. The action of the PVP and the endoglucanase in fabric colour maintenance upon laundering is superior to the sum of the individual actions of both these ingredients. See also ARR27699. (Updated on 25-MAR-2003 to correct PN field.) (Updated on 24-OCT-2003 to standardise OS field)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 305 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Disclosure; Page 16; 23pp; English
  Convents AC,
                                                                                                                                                                                                                   02-SEP-1993
                                                                                                                                                                                                                                                                                                                                                         Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Humicola
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Detergent; fabric; Humicola insolens;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Endoglucanase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      28-APR-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAR42063;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAR42063 standard; protein; 305 AA.
                                                                                                                                                             18-FEB-1992;
                                                                                                                                                                                                                                                                         AU9211048-A
                                                      (PROC ) PROCTER & GAMBLE CO.
                                                                                                                                                                                                                                                                                                                                                                                                            Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SFPAPIKPGCQWRFDWFQNADNPTFTFQQVQCPABIVARSGCKRNDDSSFP-VFTPPSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LSDFNVQSGCN-GGSAYSCADQTFWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIENGCSSQEGGLPGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MRSSPILESAVVAALEVLALAA--DGRSTRYWDCCKESCGWAKKAEVNQEVESCNANEQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MRSTPVLRTTLAAALPLVASAASGSGQSTRYMDCCKPSCAWPGKAAVSQPVYACDANEGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DWYHQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REPDALKPGCYWREDWEKNADNPSESERQVQCPAELVARTGCRRNDDGNEFAVQIESSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGTFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SSPVNQPTSTSTTSSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NGGTGTFTSTAPGSGQTS-----PGGGSGCTSQXWAQCGGIGFSGCTTCVSGTTCQXLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            insolens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (first entry)
Busch A,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   enzyme
                                                                                                      92AU-00011048
                                                                                                                                                             92AU-00011048
                                                                                                                                                                                                                                                                                                                          22. 305
/label= mat_protein
                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               299
                                                                                                                                                                                                                                                                                                                                                                             /label=_sig_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          surfactant; softening clay; cellulase;
Fusarium oxysporum; endoglucanase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               69.9%;
  Baeck AC;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 1159; DB 2;
Pred. No. 1.4e-80;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (Updated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           178
```

```
RESULT 12
AAR37150
                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            먉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A new detergent comprises a high activity cellulase in combination with a softening clay. The cellulase may be an endoglucanase enzyme derived from Humicola insolens (AAQ49941) or Fusarium oxysporum (AAQ49941). The combination provides a higher than additive softening performance and excellent colour rejuvenation and whiteness maintenance for fabrics
                                                                                                                                                                                                                                        25-MAR-2003
25-AUG-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim 5; Page 54-55; 71pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Detergent compsns., esp. for fabrics - contain surfactant, softening clay and high activity cellulase, partic. from Humicola insolens.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N-PSDB; AAQ49941.
                                                                                               Peptide
                                                                                                                                                                                                                                                                                                      AAR37150 standard; protein; 305 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 1993-328419/42
           06-NOV-1991;
                                   12-MAY-1993
                                                                                                                                      ě
                                                                                                                                                               Humicola
                                                                                                                                                                                                                Dye transfer
                                                                                                                                                                                                                                                                                AAR37150;
                                                           EP540784-A1
                                                                                                                         Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    120
                                                                                                                                                                                                                                                                                                                                                                       299
                                                                                                                                                                                                                                                                                                                                                                                             293
                                                                                                                                                                                                                                                                                                                                                                                                                        239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                     SPVNQPTSTSTTSTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SPPAPLKPGCOMREDMEONADNETETEOCYOCOPABIVARSGCKRNDDSSEP-VETEPSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LSDENVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTETSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 305 AA;
                                                                                                                                                               insolens.
                                                                                                                                                                                                                                                                                                                                                                       DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                               DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REPDALKPGCYMREDWEKNADNESESEROVOCEAELVARTGCRRNDDGNEDAVOIESSST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNOPVFSCNANFOR
                                                                                                                                                                                                                                                                                                                                                                                                                                             NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQXWAQCGGTGFSGCTTCVSGTTCQKLN
                                                                                                                                                                                       homogeneous endoglucanase component; 43kD cellulase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                               inhibiting compsn. cellulase.
                                                                                                                                                                                                                                        (revised)
(first entry)
             91EP-00202882.
                                                                                                 /note= "signal peptide"
22. .305
                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           69.9%;
                                                                                     "mature peptide"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 1159; DB 2;
Pred. No. 1.4e-80;
14; Mismatches 47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  10;
                                                                                                                                                                                                                                                                                                                                                                                                                           298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                    292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 118
```

```
PRESULT 13
ANYSTAR
ID AAYSTAR
XX AAYST
AC AAYST
XX AAYST
XX AAYST
XX AAYST
XX Endog
XX Endog
XX Gegra
XX Humic
XX Humic
XX Humic
XX I EP633
XX EP633
XX I 1-JA
XX 2-JU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The sequence is that of a cellulase which is characterised in that the cellulase provides at least 10% removal of immobilised radioactive labelled carboxymethyl cellulose according to the C14CMC method at 25 x 10(-6)% by weight of the cellulase protein in the test solution. It can be used as part of a compsn. for inhibiting dye transfer. (Updated on 25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Compsn. for inhibiting dye transfer during fabric washing - contains peroxidase, hydrogen peroxide, substrate and cellulase, esp. endoglucanase from Humicola insolens.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Seguence 305 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Disclosure; Page 18-19; 28pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mccorquodale F,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     06-NOV-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MAR-2003 to correct PN field.)
                                                                                                                                                               Endoglucanase; cellulase enzyme; detergent composition; anion surfactant;
degradation protection; liquid detergent; long term stability.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (PROC ) PROCTER & GAMBLE CO
  28-JUN-1993;
                                                                                                                         Humicola
                                                                                                                                                                                                                                                                   25-APR-2000
                                                                                                                                                                                                                                                                                                            AAY67388;
                                                                                                                                                                                                                                                                                                                                                  AAY67388 standard;
                                          11-JAN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1993-153868/19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                                                                                                                                                                                      299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAQ41732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SPAPIKPGCOWRPDWFQNADNPTETFQQVQCPAEIVARSGCKRNDDSSFF-VFTPPSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIENGCSSQFGGLFGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LSDENVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SSPVNQPTSTSTTSTSTSSPPVQPTTPSSCTAERWAQCGGNGWSGCTTCVAGSTCTKIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PVAGKIMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                      DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DYYSOCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NGGTGTFTSTAFSSGGTS-----PGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REPDALKEGCYWREDWEKKADNESESERQVQCEAELVARTGCRRNDDGNEEAVQIESSST 238
                                                                                                                         insolens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                           endoglucanase enzyme
                                                                                                                                                                                                                                                                   (first entry
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     91EP-00202882
    93EP-00870122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Busch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             299
                                                                                                                                                                                                                                                                                                                                                  protein; 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   69.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  44:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1159;
Fred. No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                    Å
                                                                                                                                                                                                                           protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .4e-80;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 2;
                                                                                                                                                                                                                             sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          298
      RESULT 14
AAWO1502
ID AAWO1
AC AAWO1
AC AAWO1
XX
DT 16-OC
DT 27-AU
DT 26-FE
XX
DX 343 kI
XX
DE 43 kI
XX
DE 621
XX
COLOU

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                문
                                                                                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                           윰,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         멂
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim
                                                                                                                                                                 16-OCT-2003
27-AUG-2003
  Detergent composition; cellulase; retaining-type activity; catalytic activity; cellotriose; particulate soil removal; colour clarification; cleaning; cellulose-containing fabric; cellubiohydrolase; endoglucanase.
                                                                                                            43
石
                                                                                                                                                                                                                                   AAW01502;
                                                                                                                                                                                                                                                                          AAW01502 standard;
                                                                                                                                                   26-FBB-1997
```

1.1 9.1

118

238 178 60

58

endoglucanase, EG V.

(first entry)

revised) revised

protein;

305 ₹

```
Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This sequence represents the Humicola insolens endoglucanase enzyme protein sequence. The enzyme is a cellulase enzyme used in the liquid detergent composition of the invention. The detergent comprises an anion surfactant, a cellulase enzyme and a cellulase stabilising amount of an amine of the formula RIRZR3N; where R1 and R2 are independently H or a C2 -C9 alkyl chain, and R3 is a C2-C9 alkyl chain or cyclohexyl or cyclopentyl or cycloheptyl. The amine prevents the cellulase enzyme from becoming degraded. The composition is used as a liquid detergent, and has long term stability, it is applicable to the protection of an cellulase and can be used in the presence of proteases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-PSDB; AAZ60178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (PROC ) PROCTER & GAMBLE CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              28-JUN-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 305 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   detergent compsns. - contg. hydrophobic amine(s) for cellulase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1995-038508/06.
                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                             119
                                                                                                                                                                                                          179
                                                                                                                                                                                                                                                                                                                                           120 PVAGKTMYVQSTSTGGDLGSNQFDLAMPGGGVGIENGCSSQFGGLPGAQVGGISSRDQCD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      206;
  299
                                                   293
                                                                                                   239
                                                                                                                                                      239
                                                                                                                                                                                                                                                                                                                                                                                                              59
                                                                                                                                                                                                                                                                                                                                                                                                                                               61 LSDFNVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 MRSSPILLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR
DWYHOCL 305
                                                DYYSOCL 299
                                                                                                                                                                                                       REPDALKPGCYMREDWEKNADNPSESERQVQCPAELVARTGCRRNDDGNFPAVQIPSSST 238
                                                                                                                                                                                                                                       SPPAPLKPGCOMREDWEGNADNETETEQQVQCEAEIVARSGCKRNDDSSEE-VETEPSGG
                                                                                                                                                                                                                                                                                                        ITDFDAKSGCGPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                      SSPVNQPTSTSTTSTSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN
                                                                                                                                                      NGGTGTPTSTAPGSGQTS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Page 18-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           93EP-00870122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              69.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             28pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ; Score 1159; DB 2;
; Pred. No. 1.4e-80;
44; Mismatches 47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             English
                                                                                                                                         -PGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
```

```
Detergent compositions comprising: 1) a first cellulase component having cretaining-type activity, pref. having a catalytic activity on cellutriose at pH 8.5 corresponding to kat of at least 0.01 s<-1>, and capable of correct of component having the score of cellulase component having comprising at least 0.01 s<-1>, and capable of complete domain, pref. having a catalytic activity on Red Avicel 7.5 cc per 1 mg of cellulase protein higher than 10<-4> IV and being capable of colour clarification, where at least one of the cellulase components is a single (*recombinant) component, are useful for cleaning and colour clarification of cellulose-containing fabrics. The second cellulase component component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunoreactive with an component can be an endoglucanase which is immunore
                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Detergent compsn. contg. two cellulase components - the first removing soil particles and the second capable of colour clarification, useful:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (NOVO )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim 25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 1995-067325/09
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Schuelein M,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12-JUL-1993;
11-OCT-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       07-JUL-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 26-JAN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           W09502675-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Humicola
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      16-OCT-2003 to standardise OS field)
239 SSPUNQPTSTSTSTSTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN 298
                                                                                                                                                                       119
                                           239
                                                                                   179
                                                                                                                           180
                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                               206;
                                                                                                                                                                                                                                                      59
                                                                                                                                                                                                                                                                                             13
                                                                                                                                                                                                                                                                                                                                         <u>سر</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PROCTER & GAMBLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                               insolens; DSM 1800.
                                                                                                                                                                                                                                                      ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGEAATSIAGSNEAGWCCACYELTFTSG 118
                                                                                                                                                                                                                                                                                  LSDENVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG
                                                                                                                                                                                                                                                                                                                                       MRSSPILIPSAVVAALIPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR 58
                                         NGGTGTFTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLN
                                                                                 REPDALKPGCYWREDWEKNADN?SESERQVQCPAELVARTGCRRNDDGNEPAVQIPSSST
                                                                                                           SFPAPIKPGCQWREDWEQNADWPTETFQQVQCPAFIVARSGCKRWDDSSFP-VFTPPSGG
                                                                                                                                                                       PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                        PVAGKIMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Page 66-67; 83pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Æ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Convents A,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          93EP-00870131.
93DK-00001135.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       94WO-DK000280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               & CAMBLE CO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1. .21
/label=_signal_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              22. .305
/label= mature_protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                               69.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Jeffreys B,
                                                                                                                                                                                                                                                                                                                                                                                                                             44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 1159;
Pred. No. 1.
                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Tikhomirov DF
                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       띮
                                                                                                                                                                                                                                                                                                                                                                                                                               47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       305;
                                                                                                                                                                                                                                                                                                                                                                                                                               10;
                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                 238
                                                                                                                                                                                                                                                                                                                                                                                     60
                                                                                       238
                                                                                                                                                                         178
                                                                                                                                                                                                                                                                                                  119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 15
AAR88471
                                                                                                                                                                                                                                                                                                      XAXEEXXEXXXXXXEEEEXXEXEXEXEXEXEXEXEXEEEXXEXSOOOOO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              よ
      S
                                                몽
                                                                                       Q
                                                                                                                                 В
                                                                                                                                                                       Ś
                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                      Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Fusarium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Alkaline
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Alkaline
                                                  52
                                                                                       61
```

Š 당 Ś 당 8

Ş 밁 S 양

179 118 119 58 60

```
Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            16-OCT-2003
03-APR-1996
                                                                                                                                                                                                                                                                                                                                                                   The Humicola insolens DSM 1800 alkaline endoglucanase Carezyme (AAR88471), a derivative of a 43 kDa cellulase, is expressed in non-toxic, non-toxigenic, non-pathogenic, protease-deficient recombinant Fusarium graninearum ATCC 2034 carrying plasmid pDML51. This plasmid includes the Carezyme gene (AAT10182) operably linked to promoter and terminator (AAT10184-85) sequences of the Fusarium oxysporum trypsin-like protease SP387 gene. Recombinant enzyme is produced at levels of 6.0 g/1 host cell; over 90% of secreted protein is Carezyme. (Updated on 16-OCT-2003 to standardise OS field)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Non-toxic, non-toxigenic, nor used to produce heterologous factors or receptors.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Humicola insolens; DSM 1800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAR88471 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Royer JC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  30-JUN-1994;
15-MAR-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAR88471;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 13; Page 22-24; 38pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15-JUN-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11-JAN-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO9600787-AI
                                                                                                                                                                                                                                                                                                                               Sequence 305 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (MOVO ) MOVO NORDISK BIOTECH INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1996-077498/08.
DB; AAT10182.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   299 DWYHQCL
120 PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD
                                                                                                                                                                                                                                               206;
                                                                                                                                                                                                    μ
                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 endoglucanase Carezyme.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        endoglucanase; carezyme; cellulase; host cell;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 graminearum; heterologous gene expression
                                                                                                             LSDFNVQSGCN-GGSAYSCADQTFWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG
                                                                                                                                                    MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDAWFQR
                                                                      ITDFDAKSGCEPGGVÄYSCADQTPWÄVNDDFÄLGFÄÄTSTÄGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Moyer DL,
                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (revised)
(first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  94US-00269449.
95US-00404678.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    95WO-US007743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /label= Sig_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein;
                                                                                                                                                                                                                                                                 69.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Yoder W,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              non-pathogenic recombinant Fusarium host cell ous proteins, pref. enzymes, hormones, growth
                                                                                                                                                                                                                                               44; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          305 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                English
                                                                                                                                                                                                                                                                 Score 1159; DB 2;
Pred. No. 1.4e-80;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Shuster JR;
                                                                                                                                                                                                                                                                                        DB 2;
                                                                                                                                                                                                                                                 47;
                                                                                                                                                                                                                                                                                          Length 305;
                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                               10;
                                                                                                                                                                                                                                                 Gaps
```

```
Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                 Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   on:
                                                                                                                                                                                                                                                                                                                                                                                                                             Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                       1112
1112
1107.5
1077.5
1076.5
1045
1039
                                                                                                                                                                                                                                                                                                                                                                 Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        seq length: 0
seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                 Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                July
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      389414 segs, 51625971 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BLOSUM62
 1 MRSTPVLRTTLAAALPLVAS...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-10-007-521-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Issued Patents AA:*

1: /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*

2: /cgn2_6/ptodata/2/iaa/5B_COMB.pep:*

3: /cgn2_6/ptodata/2/iaa/6A_COMB.pep:*

4: /cgn2_6/ptodata/2/iaa/6B_COMB.pep:*

5: /cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2004, 08:46:10 ; Search time 22 Seconds (without alignments)
701.644 Million cell updates/sec
  US-08-872-437-2
US-08-651-136C-12
US-09-225-9911A-12
US-09-230-222-1
US-09-230-222-1
US-08-09-210-328-2
US-38-091-426-8
US-38-091-426-8
US-08-816-340-1
US-08-816-915-8
US-09-189-0608-56
US-09-189-0608-66
US-09-189-0608-66
US-09-189-0608-68
US-09-189-0608-68
US-09-189-0608-68
US-09-189-0608-68
US-09-189-0608-68
US-09-189-0608-70
US-09-189-0608-70
US-09-189-0608-72
US-09-189-0608-72
US-09-189-0608-72
US-09-189-0608-72
US-09-189-0608-73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TICVSGIICQKENDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                389414
 Sequence 2, Appli
Sequence 12, Appli
Sequence 1, Appli
Sequence 2, Appli
Sequence 3, Appli
Sequence 4, Appli
Sequence 1, Appli
Sequence 1, Appli
Sequence 6, Appli
Sequence 2, Appli
Sequence 2, Appli
Sequence 3, Appli
Sequence 6, Appli
Sequence 7, Appli
Sequence 10, Appli
Sequence 10, Appli
Sequence 10, Appli
Sequence 10, Appli
Sequence 70, Appli
Sequence 70, Appli
Sequence 71, Appli
Sequence 31, Appli
Sequence 31, Appli
Sequence 31, Appli
                                                                                                                                                                                                                                                                                                                                                                 Description
```

DD 42	6	Query Ma Best Loo Matches	RESULT US-08-8 ; Seque ; Seque ; GENER ; APPL ; APPL ; ITITL ; ITITL ; CURR ; C		22222222222222222222222222222222222222
121 V/ 181 F1 181 F1 181 F1 241 G 241 G	1 MRS 1 MRS 61 LSD 61 LSD 61 LSD	atch cal s 299	Sequence 2, Application US/088 CEREAL INFORMATION: Absent TITLE OF INVENTION: Garments TITLE OF INVENTION: Abrasion FILE REFERENCE: 4888.200-US CURRENT PILING DATE: 1997-06 EARLIER APPLICATION NUMBER: 1 EARLIER FILING DATE: 1996-111 NUMBER OF SEQ ID NOS: 2 SOFTWARE: FastSEQ for Windows SEQ ID NO 2 LENGTH: 299 TYPE: PRT ORGANISM: Thielavia terrest: COGGANISM: Thielavia terrest:		1021 1021 1023 994.5 968.5 962 962 951 939.5 939.5 939.5 939.5 939.5 939.5
VAGKTMYVQS VAGKTMYVQS FPAPLKPGCC FPAPLKPGCC GTGTPTSTAF GTGTPTSTAF	SSTEVLRTTLAAAL	nilarity Conserva	37-2 2, Application US/08872. 2, Application US/08872. NFORMATION: T: LAUND, Henrik T: KALIUM, Lisbeth 'INVENTION: Garments Wil' 'INVENTION: Garments Wil' 'INVENTION: Abrasion Legents 1982-200-US APPLICATION NUMBER: US/0 PILLING DATE: 1997-06-10 APPLICATION NUMBER: 127- FILLING DATE: 1996-11-13 AP SEQ ID NOS: 2 SEQ ID NOS: 2 129 229 RT M: FastSEQ for Windows Will 229 RT M: Thielavia terrestris M: Thielavia terrestris		555.66.66.66.66.33.00.05.55.73.33.00.05.55.66.66.66.33.35.55.73.35.75.75.75.75.75.75.75.75.75.75.75.75.75
WREDWI WREDWI WREDWI WREDWI GSGQTV	LAAALI LAAALI NGGSA NGGSA NGGSA	100. 100. ative	ion US/08B72437 nrik isbeth Garments With Abrasion Level R.200 US NUMBER: US/08/ NUMBER: 1276/9 S: 1996-11-13 S: 196-11-13 S: 196-11-13 Cor Windows Vers		308 308 297 297 234 2310 310 316 376 376 376 376 376
SPG SPG	DICE XSC XSC PLLV	 % %	000 000 000 000 000 000 000 000 000 00		ろ 43443434111224434
VAGKTMYVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQPGGLEGAQYGGISSRDQCDS VAGKTMYVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQPGGLEGAQYGGISSRDQCDS FPAPLKPGCQHR=DHFQNADNPTFTFQQVQCPASIVARSGCKRNDDSSPPVFTPPSGGNG FPAPLKPGCQHR=DHFQNADNPTFTFQQVQCPASIVARSGCKRNDDSSPPVFTPPSGGNG FGTPTSTAPGSGQTSPGGGSGCTSQXWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL	VAGKTMYVQSTSTGGDLGSNQFDIAMPGGGYGIFNGCSSQFGGLFGAQ	; Score 1659; DB 2; Lengt; Pred. No. 2.5e-127; O; Mismatches 0; Indel	872437 With Considerable Variation Level US/08/872,437 -10 1276/96 -13 rs Version 3.0	ALIGNMENTS	US-08-651-136C-6 US-09-229-911A-6 US-09-229-911A-4 US-09-229-911A-4 US-09-229-911A-2 US-09-229-911A-2 US-09-229-911A-2 US-08-651-136C-2 US-09-229-911A-8 US-08-090-013-4 US-08-081-328-4 US-08-381-328-4 US-08-381-3861-3861-38
DDSGFPVFTPPSGGNG 240 DDSGFPVFTPPSGGNG 240 DDSGFPVFTPPSGGNG 240 DDSGFPVFTPPSGGNG 240 DGTTCQKLNDYYSQCL 299	TYPHOCKPSCAMPGKAAVSUPVJACDANEQR 60 RYMDCCKPSCAMPGKAAVSQPVJACDANEQR 60 LAYGEAATSIAGGSESSWCCACYALTETSGP 120 LAYGEAATSIAGGSESSWCCACYALTETSGP 120 LAYGEAATSIAGGSESSWCCACYALTETSGP 120 LAYGEAATSIAGGSESSWCCACYALTETSGP 120 CAYGIFNGCSSQFGGILPGAQYGGISSRDQCDS 180	,	n In		Sequence 6, Appli Sequence 4, Appli Sequence 4, Appli Sequence 6, Appli Sequence 6, Appli Sequence 22, Appl Sequence 22, Appli Sequence 8, Appli Sequence 4, Appli Sequence 24, Appli Sequence 24, Appli Sequence 24, Appli Sequence 24, Appli Sequence 24, Appli Sequence 24, Appli

RESULT 2 US-08-651-136C-12 ; Sequence 12, Application US/08651136C

```
RESULT 3
US-09-229-911A-12
                                                                                                                                               Õ
                                                                                                                                                                                                                                                                             S
                                                                                                                                                                                                                                                                                                                                                                                    맑
                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                  밁
                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                               QC dC
                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-08-651-136C-12
Seguence 12, Application US/09229911A Patent No. 6387690 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Patent No. 6001639
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches 299;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ZIP: 10174-6401
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IEM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PACEDAGE #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/651,136C
FILING DATE: 21-MAY-1996
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX: 212-878-9655
INFORMATION FOR SEQ ID NO: 12:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Takagi, Shinobu
TITLE OF INVENTION: No. 6001639el Endoglucanases
NUMBER OF SEQUENCES: 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTORNEY/AGENT INFORMATION:
NAME: Lambiris, Elias J.
REGISTRATION NUMBER: 33,7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE/DOCKET NUMBER: 43
TELECOMMUNICATION INFORMATION: 212-867-0123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TYPE: amino acid
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COUNTRY: United States of America ZIP: 10174-6401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LENGTH:
                                                                                                                                          241 GTGTPTSTAPGSGQTSPGGSSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                       181 FPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPABIVARSGCKRNDDSSFPVFTPPSGGNG 240
                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                           121 VAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDS 180
                                                                                                                 241
                                                                                                                                                                                                                                                     121 VAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDS 180
                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                          61 LSDENVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGSSESSWCCACYALTETSGP 120
                                                                                                                                                                                                                                                                                                                                                                                    \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                    1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SSEE: No. 60016390 No. 6001639disk of No. 6001639th America, Inc.
T: 405 Lexington Avenue, 64th Floor
New York
                                                                                                                GTGTETSTAPGSGQTSPGGGSGCTSQKWAQCGGIGESGCTTCVSGTTCQKLNDXYSQCL
                                                                                                                                                                                                                                                                                                                     LSDENVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGP 120
                                                                                                                                                                                                                                                                                                                                                                                      MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               New York
                                                                                                                                                                                    FPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFPWFTPPSGGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Andersen, Lene N.
Lassen, Soren F.
Kauppinen, Markus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       299 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nielsen, Ruby I.
Ihara, Michiko
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Lange, Lene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Schulein, Martin
                                                                                                                                                                                                                                                                                                                                                                                                                                                  100.0%; Su
100.0%; Pr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       33, 728
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4366.200-US
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1659; DB 3;
Pred. Mo. 2.5e-127;
); Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ġ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 3; Length 299;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                         0
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                     299
                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                    ġ
                     RESULT 4
US-09-230-222-1
                                                                                       В
                                                                                                                   Q
                                                                                                                                                      밁
                                                                                                                                                                                  Ş
                                                                                                                                                                                                                     븅
                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                      몽
                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                        片
                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                       Best Local Sir
Matches 299;
                                                                                                                                                        181
                                                                                                                                                                                                                         121
```

```
US-09-229-911A-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEFAX: 212-878-9655
INFORMATION FOR SEQ ID NO: 12:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION DATA:

APPLICATION DATA:

APPLICATION DATA:

APPLICATION DATA:

APPLICATION DATA:

PRIOR APPLICATION DATA:

FILING DATE: 21-MAY-1996

ATTORNEY,AGENT INFORMATION:

NAME: Lambiris, Elias J.

REGISTRATION UNMERR: 33,728

REGRENOWEDOCKET NUMBER: 33,728

REFERENCE,DOCKET NUMBER: 33,66.200-US

TELEPHONE: 212-867-0123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Takagi, Shinobu
TITLE OF INVENTION: No. 6387690el Endoglucanases
NUMBER OF SEQUENCES: 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TOPOLOGY: linear
MOLECULE TYPE: protein
SEQUENCE DESCRIPTION: SEQ ID NO: 12:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ZIP: 10174-6401
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: Schulein, Martin
                                                                                                                                       181 FPAPLKPGCOWREDWEQNADNPTETFQQVQCPAEIVARSGCKRNDDSSFPVETPPSGGNG 240
                                       241 GTGTPTSTAPGSGQTSEGGGSGCTSQKMAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL
                                                                                                                                                                                                                           121 VAGKTMVVQSTSTGGDLGSNQFDLAMPGGGVGLFNGCSSQFGGLPGAQVGGLSSRDQCDS 180
                                                                                                                                                                                                                                                                                            61 LSDFNVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGP
                                                                                                                                                                                                                                                                                                                            61 LSDENVQSGCNGGSAYSCADQTPWAYNDNLAYGFAATSIAGGSESSWCCACYALTETSGP 120
                                                                                                                                                                                                                                                                                                                                                                                                1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                               1 MRSTPVLRTTLAAALDIVASAASGSGGSTRYWDCCKPSCAWPGXAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                              VAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: US/09/229,911A FILING DATE: 13-Jan-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER: IBM PC Compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
GTGTPTSTAPGSGQTSPGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                              PPAPLKPGCOWREDWPONADNPTFTPOOVOCPABIVARSGCKRNDDSSPPVFTPPSGGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COUNTRY: United States of America
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CITY: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STREET: 405 Lexington Avenue,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ADDRESSEE: No. 6387690o No. 6387690disk of No. 6387690th America, Inc. STREET: 405 Lexington Avenue, 64th Floor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH: 299 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nielsen, Ruby I.
Ihara, Michiko
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lange, Lene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Lassen, Soren F.
Kauppinen, Markus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Andersen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 1659; DB 4;
Pred. No. 2.5e-127;
Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 299;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ٥,
                                                            299
                                                                                                        240
                                                                                                                                                                                                         180
                                                                                                                                                                                                                                                                                                          120
```

Sequence 1, Application US/09230222A

```
GENERAL INFORMATION:
APPLICANT: MURASHEMA, KOUTCHIROU
APPLICANT: MORIYA, TAISUKT
APPLICANT: HANAYA, TORU
APPLICANT: KORA, JINICHIRO
APPLICANT: KORA, JINICHIRO
APPLICANT: KOMIDA, MAOMI
APPLICANT: KONJAGI, KAORU
APPLICANT: KONJAGI, KAORU
APPLICANT: KONJAGI, KAORU
APPLICANT: KONJAKAMI, TAKESHI
APPLICANT: KONJ, TOSHIAKI
TITLE OF INVENTION: CONTAINING THE SAME
TITLE OF INVENTION: CONTAINING THE SAME
FILE REPERENCE: 99-0055*/LC(NMC)/144
CURRENT APPLICATION NUMBER: US/0)/230,222A
CURRENT APPLICATION NUMBER: US/0)/230,222A
CURRENT FILING DATE: 1999-03-03
NUMBER OF SEQ ID NOS: 31
COLUMBER OF SEQ ID NOS: 31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-230-222-1
                                                                                                                                                                                                                                                                                                                                                                                 US-08-090-013-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOFTWARE: PatentIn Ver. 2.0 SEQ ID NO 1
                                                                                                                                                                                                                                                                                                                     Sequence 2, Application Patent No. 5443750
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 209;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Patent No. 6159720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYPE: PRT
CRGANISM: Humicola insolens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LENGTH: 305
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
                                                                                                                                                                                               TITLE OF INVENTION: DETERGENT COMPOSITION WITH HIGH ACTIVITY TITLE OF INVENTION: CELLULASE AND SOFTENING CLAYS NUMBER OF SEQUENCES: 4
                                                                                                                                                                                                                                                         APPLICANT: BUSCH, ALERED APPLICANT: BAECK, ANDRE C
                                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Match 71.0%;
Local Similarity 68.1%;
                                                            COUNTRY: USA
ZIP: 45217
                                                                                                 STATE:
                                                                                                                                       ADDRESSEE: THE PROCTER & GAMBLE COMPANY STREET: 5299 SPRING GROVE AVENUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        239 WGGTGTFTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCVKIN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                              299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    59 LTDFDAKEGCEPGGVAYSCADQTPWAVNDDFAFGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWEGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                          , Application US/08090013 5443750
                                                                                                                    CINCINNATI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SFPAPLKPGCQWREDWFQNADNPTFTFQQVQCPABIVARSGCKRNDDSSFP-VFTPPSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LSDFNVQSGCN-GSSAYSCADQTPWAVNDNLAYGFAAFSIAGGSESSWCCACYALTFTSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SSPVGQPTSTSTTSTSTTSSPPVQPTTPSGCTAERWAQCGCNGWSGCTTCVAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MRSSPLLRSAVVAALPVLALAA--DGKSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RFPDALKPGCYWRFDWFKNADWPSFSFRQVQCPAELVARTGCRRNDDGNFPAVQIPSSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                              DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQKYGGISSRNECD
                                                                                                 OHIO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                  CONVENTS, ANDRE C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                44; Mismatches 44; Indels 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 1178; DB 3; Pred. No. 3.1e-88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                               RESULT 6
US-08-081-328-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             멅
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches 206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local &
    COUNTRY: USA
ZIP: 45253-8707
COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
                                                                                   CITY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               239
                                                                                   OIHO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
```

S

吊

Ś 문 8 다 8 Вò S 망

```
; Sequence 2, Application US/08081328 ; Patent No. 5520838
                                                                                                                                                                              Patent No. 5520838
GENERAL INFORMATION:
APPLICANT: BAECK, ANDRE C.
APPLICANT: CEULEMANS, RAPHAEL ANGELINE
APPLICANT: BUSCH, ALFRED (NMM)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEFAX: 513-627-4854
INFORMATION FOR SEQ ID NO: 2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: EP 912
FILING DATE: 06-NOV-1991
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/090,013
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE/DOCKET NUMBER: CM
TELECOMMUNICATION INFORMATION:
TELEPHONE: 513-627-6437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS:
                                                                           NUMBER OF SEQUENCES: 4
CORRESPONDENCE ADDRESS:
                                                                                                                              TITLE OF INVENTION: COMPACT DETERGENT COMPOSITIONS WITH TITLE OF INVENTION: HIGH ACTIVITY CELLULASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NAME: PATEL, KEN K.
REGISTRATION NUMBER: 33,988
ADDRESSEE: THE PROCTER & GAMBLE COMPANY STREET: 11810 East Miami River Road CITY: CINCINNATI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              239 NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQXLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61 LSDENVQSGCN-GGSAYSCADQTPWAVNDNLAYGEAATSIAGGSESSWCCACYALTETSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59 ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGEAATSTAGSNEAGWCCACYELTETSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | MRSTPVLRTTLAAALPLYASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1: 305 amino acids
amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RPPDALKPGCYWRFDWFKNADNPSFSERQVQCPAELVARTGCRRNDDGNFPAVQIPSSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIENGCSSQFGGLFGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                          DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SSPVNQPTSTSTTSTSTTSSPPVQPTTPSGCTAERWAQCGCNGWSGCTTCVAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEPAPLKPGCOMREDWEQNADNETFTEQQVQCEAEIVARSGCKKNDDSSFP-VFTPPSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PVAGKKNVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              69.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EP 91202880.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; Score 1159; DB
; Pred. No. 1.1e-
44; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CM393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1.1e-86;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         10;
```

Gaps

119 58 6

118

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    먉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     용
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-08-081-328-2
                                                                                                                                                                                                                                                                                                                                                                                                            US-08-232-249-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                            Sequence 2, Application US/08232249
Patent No. 5610129
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEFAX: 513-627-0318
INFORMATION FOR SEQ ID NO: 2:
SEQUENCE CHARACTERISTICS:
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PATENTIA Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TOPOLOGY: linear MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATTORNEY/AGENT INFORMATION:
NAME: ZERBY, KIM WILLIAM
REGISTRATION UNMER: 32,323
REFERENCE/DOCKET NUMBER: CM356M
REFERENCE/DOCKET NUMBER: CM356M
TELECOMMUNICATION INFORMATION:
                                                                                                                                                            CORRESPONDENCE ADDRESS:
ADDRESSE: THE PROCTER & GAMBLE COMPANY
STREET: 5299 SPRING GROVE AVENUE
CITY: CINCINNATI
STATE: OHIO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOFTWARE: Patentin Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                APPLICANT: MCCORQUODALE, FINLAY (NMN)
APPLICANT: BUSCH, ALFRED (NMN)
TITLE OF INVENTION: DYE TRANSFER INHIBITING COMPOSITIONS
NUMBER OF SEQUENCES: 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             y Match 69.9%; Score 1159; DB 1;
Local Similarity 67.1%; Pred. No. 1.1e-86;
hes 206; Conservative 44; Mismatches 47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: US/08/081,328
FILING DATE: 11/19/93
CLASSIFICATION: 252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                      ZIP: 45217
                                                                                                                                             COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180 SFPAPLKEGCOWREDWEQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSEE-VETPPSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            299 DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                293 DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                239 NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQXWAQCCGTGFSGCTTCVSGTTCQXLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     119 PVAGKOVVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLFGQRYGGISSRNECD 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               120 PVAGKTMYVQQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLFGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    59 ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61 LSDFNVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       H: 305 amino acids
amino acid
OGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REPDALKPGCYWREDWEKNADNESESERQVQCPASLVARTGCRRNDDGNEPAVQIESSST
                                                                                                                                             USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              513-627-2885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Version
                       Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 47; Indels 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4
```

```
Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                            US-08-921-426-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         멂
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-08-232-249-2
                                                                                                                                                                                                                                                                                                                                                                                              ; Sequence 8, Application US/08921426 ; Patent No. 5837847
                                                                                                                                                                                                                    GENERAL INFORMATION:

APPLICANT: Royer, John C

APPLICANT: Woyer, Donna L

APPLICANT: Yoder, Wendy T

APPLICANT: Shuster, Jeffrey R

APPLICANT: Shuster, Jeffrey R

TITLE OF INVENTION: NON-TOXIC, NON-TOXIGENIC, NON-PATHOGENIC

TITLE OF INVENTION: FUSARIUM EXPRESSION SYSTEM

NUMBER OF SEQUENCES: 16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CLASSIFICATION: 510
PRIOR APPLICATION DATA:
APPLICATION UNMBER: EP 91202882.6
FILING DATE: 06-NOV-91
ATTORNEY/AGENT INFORMATION:
NAMS: ALLEN, GEORGE W.
REGISTRATION UNMBER: 26,143
REFERENCE/DOCKET NUMBER: CM-395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEFAX: 513-627-8118
INFORMATION FOR SEQ ID NO: 2:
STATE: New York
COUNTRY: USA
ZIP: 10174-6401
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: LIM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE CHARACTERISTICS:
LENGTH: 305 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MOLECULE TYPE: protein
                                                                                                                                                          CORRESPONDENCE ADDRESS:
ADDRESSEE: No. 58378470 No. 5837847disk of No. STREET: 405 Lexington Avenue, 64th Floor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        y Match 69.9%; Score 1159; DB 1; Local Similarity 67.1%; Pred. No. 1.1e-86; hes 206; Conservative 44; Mismatches 47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TYPE: amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER: US/0:
FILING DATE: 05-MAY-1994
                                                                                                                                               STREET: 405 Le:
CITY: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120 PVAGKTMVVQSTSTGGDLGSNQFDLAMPGGGVGIFNGCSSQFGGLFGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          299 DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 293 DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 239 NGGTGTPTSTAPGSGQTS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 59 ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 MRSSPILIPSAVVAALPVLALAA--DGRSTRYMDCCKESCGWAKKAPVNQPVFSCNANFQR 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 MRSTPVLRTTLAAALELVASAASGSGQSTRYWDCCKESCAWPGKAAVSQPVYACDANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SFPAPIKPGCQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFP-VFTPPSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SSPVNQPTSTSTTSTSTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RFPDALKPGCYWRFDWFKNADNPSFSFRQVQCPAELVARTGCRRNDDGNFPAVQIPSSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                513-627-5946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US/08/232,249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 --- pegesecrsokwa ocegie psecricov sericokia 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                             5837847th America, Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
```

118

```
US-08-921-426-8
                                                                                                                                                                                                                                                                                                                    RESULT 9
US-08-833-642A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches 206; Conservative 44; Mismatches 47;
                                                                                                                                                                                                                                                                              Sequence 2, Application US/08833642A Patent No. 5883066
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                  GENERAL INFORMATION:
APPLICANT: Ivan M. A. J. Herbots et al.
TITLE OF INVENTION: Liquid Detergent Compositions
TITLE OF INVENTION: Containing Cellulase and Amine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INFORMATION FOR SEQ ID NO: 8: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATTORNEY/AGENT INFORMATION:
NAME: AGRIS Dr., Cheryl H.
REGISTRATION NUMBER: 34,086
                                                  ADDRESSEE: Jackie Ann Zurcher
ADDRESSEE: Dinsmore & Shohl LLP
STREET: 255 E. Fifth Street
STREET: 1900 Chemed Center
CITY: Cincinnati
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELECOMMUNICATION INFORMATION:
TELEPHONE: 212-867-0123
TELEFAX: 212-878-9655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION: 435 PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CURRENT APPLICATION DATA:
                                                                                                                                                                  NUMBER OF SEQUENCES: 5
COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FILING DATE: 01-JUI
APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: US 08/456,433 FILING DATE: 01-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE/DOCKET NUMBER: 4216.010-US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: US/08/921,426
                                  COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   119
                                                                                                                                                                                                                                                                                                                                                                                                  299 DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   239 NGGTGTFTSTAPGSGQTS-----PGGGSGCTSQKMAQCGGTGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         179 REPDALKEGCYWREDWEKNADNESESERQVQCEAELVARTGCRRNDDGNEFAVQIESSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             239 SSPVMOPTSTSTTSTSTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       120 FVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61 LSDENVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG 119
              45202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PVAGKKWYVQSTSTGGDLGSNHEDLNIPGGGVGIFDGCTFQFGGLFGQFXGGISSRNECD 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SFPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPABIVARSGCKRNDDSSFP-VFTPPSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSTAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MRSTPVLRTTLAAALPIVASAASGSGQSTRYWDCCKESCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                      DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        305 amino acids
                                    USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15-MAR-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     29-AUG-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 69.9%; Score 1159; DB 2; Length 305; 67.1%; Pred. No. 1.1e-86;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US 08/404,678
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                  RESULT 10
US-08-140-008A-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   맘
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셦
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-08-833-642A-2
                                                                                                                                                                                                                            APPLICANT:
APPLICANT:
APPLICANT:
                                                          COUNTRY:
                                                                                            STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDIUM TYPE: Diskette, 3.5 inch
                                                                                                              CITY: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     179
                                                            10174
                                                                            USA
```

Ş 닭 S 문

Ş 돲 8 밁 S 8

```
Query Match
Best Local Similarity
Matches 206; Conserve
                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 4, Application US/08140008A Patent No. 5914306
                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
APPLICANT: VON DER OSTEN, Claus
APPLICANT: CLAUSEN, Ib Groth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEPAX: (513) 977-814
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NAME: Zurcher, J. A.
REGISTRATION NUMBER: P42,251
REFERENCE/DOCKET NUMBER: CM5
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER: US/0 FILING DATE: April 8, 19 ATTORNBY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CURRENT APPLICATION DATA:
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
                                                                                                                                                             TITLE OF INVENTION: STABILIZED ENZYMES
NUMBER OF SEQUENCES: 11
CORRESPONDENCS ADDRESS:
ADDRESSEE: No. 59143060 No. 5914306disk of No. 5914306th America
STREET: 405 Lexington Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER: IBM PC Compatible OPERATING SYSTEM: MS-DOS SOFTWARE: WordPerfect 6.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: amino acid TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180 SFPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPABIVARSGCKRNDDSSFP-VFTPPSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120 PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQPGGIPGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             299 DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            293 DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      239 MGGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  119 PVAGKKNYVÓSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              59 ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SSPVNQPTSTSTTSTSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RFPDALKPGCYWRPDWPXNADNPSFSFRQVQCPAELVARTGCRRNDDGNFPAVQIPSSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNCPVFSCNANFQR 58
                                                                                                                  New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                305 amino acids
                                                                                                                                                                                                                                                                                     PATKAR, Shamkant Anant
BORCH, Kim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (513) 977-8377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3) 9,,
) 977-8141
~ NO: 2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69.9%; Score 1159; DB 2;
67.1%; Pred. No. 1.1e-86;
ative 44; Mismatches 47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US/08/833,642A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
```

118

298

292

```
; MOLECULE TYPE: US-08-140-008A-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-08-836-340-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches 206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 1, Application US/08836340
                                                                                                                                                                                                                                                                                                                                                                                                                   Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ATTORNEY/AGENT INFORMATION:
NAME: Lambiris, Elias J.
REGISTRATION NUMBER: 33,728
REFERENCE/DOCKET NUMBER: 3601
TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 867-0123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX: (212) 878-9655
INFORMATION FOR SEQ ID NO: 4:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CURRENT APPLICATION DATA:
APPLICATION NUMBER: US
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                APPLICANT: Jund, Henrik
APPLICANT: Pedersen, Hanne H st
TITLE OF INVENTION: A Method of Obtaining a Cellulosic Textile
TITLE OF INVENTION: Fabric with Reduced Tendency to Pilling Formation
NUMBER OF SEQUENCES: 1
                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Y Match 69.9%; Score 1159; DB 2; Local Similarity 67.1%; Pred. No. 1.1e-86;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH: 305 amino acids TYPE: amino acid TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FILING DATE: 22-OCT-1993
CLASSIFICATION: 252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OPERATING SYSTEM:
                                                                                                                                 COUNTRY: United States ZIP: 10174-6401
                                                                                                                                                                            STATE: New York
                                                                                                                                                                                                CITY: New York
                                                                                                                                                                                                                       STREET:
                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             293 DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      239 SSPVNQPTSTSTTSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTXIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             120 PVAGKTMVVQSTSTGGDLGSNQFDIAMEGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      59 ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LSDENVOSGCN-GGSAYSCADOTEWAVNDNLAYGEAATSIAGGSESSWCCACYALTETSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANPQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REPDALKPGCYWREDWEKNADNESESERQVQCPAELVARTGCRRNDDGNEPAVQIPSSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SFPAPIKPGCQWRFDWPQNADNPTFTFQQVQCPAPIVARSGCKRNDDSSFP-VFTPPSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGGTGTPTSTAPGSGQTS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGGTPGGTSGRNECD 178
                                                                                                                                                                                                                  405 Lexington Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (212) 878-9655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                         No. 59167980 No. 5916798disk of No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US/08/140,008A
                                                                                                                                                       of America
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           44; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3601.204-US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PGGGSGCTSQXWAQCGGIGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           47; Indels 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
```

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; Sequence 2, Application US/08389423
; Patent No. 5948672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 12
US-08-389-423-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   爿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-08-836-340-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches 206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TOPOLOGY: linear MOLECULE TYPE: protein ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Rasmussen, Grethe
APPLICANT: Mikkelsen, Jan Moller
APPLICANT: Schulen, Martin
APPLICANT: Patkar, Shankant A.
APPLICANT: Hagen, Fred
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE CHARACTERISTICS:
                                                                     COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
CURRENT APPLICATION DATA:
ATTORNEY/AGENT INFORMATION
                                                                                                                                                                                                                                                                                                              CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                       NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                     TITLE OF INVENTION: A Cellulase Preparation Comprising TITLE OF INVENTION: Endoglucanase Enzyme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM:
                                                                                                                                                                                         STATE: New York COUNTRY: United States of America ZIP: 10174-6401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER: US/08/836,340
                  APPLICATION NUMBER: US/08/389,423
FILING DATE: 14-FEB-1995
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LENGTH:
                                                                                                                                                                                                                                                      STREET: 405 Le
CITY: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                                                                                                                                                                             ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         179 REPDALKPGCYWREDWEKNADNESESERQVQCPAELVARTGCRRNDDGNEPAVQIESSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         119 PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120 PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        293 DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    239 NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          μ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        amino acid
XGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SFPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPABIVARSGCKRNDDSSFP-VFTPPSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MRSSPLLPSAVVAALPVLALAA--DGRSTRYMDCCKPSCGWAKKAPVNQPVFSCNANFQR 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SSPVNQPTSTSTTSTSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DSM 1800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             305 amino acids
                                                                                                                                                                                                                                                                           405 Lexington Avenue,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Humicola insolens
                                                                                                                                                                                                                                                                                                No. 59486720 No. 5948672disk of No. 5948672th America, Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              69.9%; Score 1159; DB 2; 67.1%; Pred. No. 1.1e-86;
                                                                                                                                                                                                                                                                                                                                       ü
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        44; Mismatches
                                                                                                                                                                                                                                                                             64th Fl∞r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         118
```

```
δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-08-389-423-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-08-816-915-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 8,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 305 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REGISTRATION NUMBER: 33,728
REFERENCE/DOCKET NUMBER: 34
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS:
ADDRESSEE: No. 66603050 No. 6060305disk of No. 6060305th America,
STREET: 405 Lexington Avenue, 64th Floor
                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: Royer, John C
APPLICANT: Moyer, Donna L
APPLICANT: Voder, Wendy T
APPLICANT: Shuster, Jeffrey R
TITLE OF INVENTION: NON-TOXIC, NON-TOXIGENIC, NON-PATHOGENIC
TITLE OF INVENTION: FUSARIUM EXPRESSION SYSTEM
ATTORNEY/AGENT INFORMATION:
NAME: Agris Dr., Cheryl H.
                                                                                                      COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                              COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: amino acid TCPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Match 69.9%; Score 1159; DB 2; Length 305; Local Similarity 67.1%; Pred. No. 1.1e-86;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEPHONE: 212-867-0123
TELEFAX: 212-878-9655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NAME: Lambiris, Elias J.
                                              FILING DATE: 13
CLASSIFICATION:
                                                            APPLICATION NUMBER: US/08/816,915
FILING DATE: 13-MAR-1997
                                                                                                                                                                                                                                                                                   CITY: New York
STATE: New York
                                                                                                                                                                                                                                          ZIP: 10174-6401
                                                                                                                                                                                                                                                              COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        123 PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                59 ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61 LSDENVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTETSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         I MRSTPVLRTTLAAALPLVASAASGSGOSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SFPADLKEGCQWRFDWFQNADNPTFTFQQVQCPABIVARSGCKRNDDSSFP-VFTPBSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SSPVNQPTSTSTTSTTSSEPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WEGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PVAGKXMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRXGGISSRNECD 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RFPDALKPGCYWRFDWFKNADNPSFSFRQVQCPAELVARTGCRRNDDGNFPAVQIPSSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Application US/08816915
                                                                                                                                                                                                                                                                                     New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           305 amino acids
                                                                                                                                                                                                                                                                 USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ν.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   44; Mismatches 47; Indels 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3469.214-US
                                                                                                                                 Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                        Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60
```

```
; TYPE: PRT
; GAGANISM: Humicola insolens
; FEATURE:
; NAME/KEY: SIGNAL
; LOCATION: (1)...(21)
US-09-189-060B-56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ŕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-09-189-060B-56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-08-816-915-8
                                                                                                                                                                                                                             PRIOR APPLICATION NUMBER: PCT/DK97/00216
PRIOR FILING DATE: 1997-05-12
NUMBER OF SEQ ID NOS: 74
SOFTWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Patent No. 6270968
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches 206; Conservative 44; Mismatches
Matches 206; Conservative
                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 56, Application US/09189060B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                      APPLICANT: Dalboge, Henrik
APPLICANT: Sandal, Thomas
APPLICANT: Kauphinen, Markus
APPLICANT: Borge, Diderichsen
TITLE OF INVENTION: Method Of Providing No. 6270968el DNA Sequences
FILE REFERENCE: 4772.204-US
CURRENT APPLICATION NUMBER: US/09/189,260B
CURRENT FILING DATE: 1998-11-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEFAX: 212-878-9655
INFORMATION FOR SEQ ID NO: 8:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REGISTRATION NUMBER: 34,086
REFERENCE/DOCKET NUMBER: 42:
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                             LENGTH: 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LENGTH: 305 amino acids TYPE: amino acid TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELEPHONE:
                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   239 SSPVNOPTSTSTTSTSTTSSPPVOPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   299 DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                59 ITDEDAKSGCEPGGVAYSCADQTPWAVNDDFALGEAATSIAGSNEAGWCCACYELTETSG 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61 LSDENVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTETSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYNDCCKPSCAMPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLFGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQXWAQCGGTGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEPAPLKPGCQWREDWEQNADNPTFTEQQVQCPABIVARSGCKRNDDSSFF-VETPESGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PVAGXXXVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNBCD 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REPDALKEGCYMREDWEKNADNESESEROVOCEAELVARTGCRRNDDGNEEAVQIESSST 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MRSSPLLPSAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  212-867-0123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       69.9%; Score 1159; DB 3; 67.1%; Pred. No. 1.1e-86; ative 44; Mismatches 47;
                      69.9%; Score 1159; DB 3; 67.1%; Pred. No. 1.1e-86;
  44; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4216.240-US
                                          Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
    Indels
    10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10;
    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
```

S

1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60

```
Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
Ď,
                       S
                                                          멼
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; ORGANISM: Humicola insolens US-09-230-665-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ŗ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        $
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ś
                                                                                          Ş
                                                                                                                              よ
                                                                                                                                                         8
                                                                                                                                                                                                  밁
                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 15
US-09-230-665-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Boyer, Stanton L
TITLE OF INVENTION: Detergent Composition Comprising Two Cellulase
TITLE OF INVENTION: Components, with and without a Cellulose-Binding Domain
TITLE OF INVENTION: Components, with and without a Cellulose-Binding Domain
FILE REFERENCE: 6191 Sequence Listing (8 Sequences)

Patent No. 6322595
CURRENT APPLICATION NUMBER: US/09/230,665
CURRENT FILING DATE: 1999-01-29
EARLIER APPLICATION NUMBER: 60/023,125
EARLIER APPLICATION NUMBER: 60/023,125
EARLIER FILING DATE: 1996-07-30
NUMBER OF SEQ ID NOS: 8
SOFTWARE: Patentin Ver: 2.1
SEQ ID NO 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
Matches 206; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 2, Application US/09230665
Patent No. 6322595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          299 EWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              293
                                                                239
                                                                                                                                 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            239
 299
                                                                                                                                                   180 SFPAPLKPGCQMRFDMFQNADNFTFTFQQVQCFAETVARSGCKRNDDSSFP-VFTFPSGG 238
                                                                                                                                                                                                  119
                                                                                                                                                                                                                     120 PVAGKTMVVQSTSTGGDLGSNQFDLAMPGGGVGLFNGCSSQFGGLPGAQYGGLSSRDQCD 179
                                                                                            239 NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQXWAQCGGTGFSGCTTCVSGTTCQXLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                59 ITDFDAKSGCEPGGVAYSCADQTPWAVKDDFALGPAATSIAGSNEAGWCCACYELTETSG 118
                                                                                                                                                                                                                                                                                       305
                                                                                                                                                                                                                                                                                                                                         ш
DWYHCCL 305
                                                              SEVNOPTSTSTSTSSEPPOPTTPSGCTABRWAQCGGNGWSGCTTCVAGSTCTXIN 298
                                                                                                                                REPDALKPGCYWREDWEKNADNESESEROVOCEAELVARTGCRRNDDGNEEAVQIESSST 238
                                                                                                                                                                                                  PVAGKKAVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD 178
                                                                                                                                                                                                                                                                                                                                       MRSSPILESAVVAALPVLALAA--DGRSTRYWDCCKPSCGWAKKAPVNQPVESCNANFQR 58
                                                                                                                                                                                                                                                                                                                                                         MRSTPVLRTTLAAALDLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DYYSOCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SSPVNOPTSTSTTSTSTSSPPVOPTTPSGCTAERWAQCGGNGWSGCTTCWAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGGTGTFTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                     69.9%; Score 1159; DB 4; Length 305; milarity 67.1%; Pred. No. 1.1e-86; Conservative 44; Mismatches 47; Indels 1
                                                                                                                                                                                                                                                                                                                                                                                                         47; Indels 10;
                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     58
                                                                                                                                                                                                                                                                                                                                                                                                           <u>بد</u>
د.
```

Search completed: July 7, 2004, 08:46:47 Job time: 23 secs

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Minimum DB seq length: 0
Maximum DB seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                         score greater than or equal to the score of the result bear and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                               pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed,
1021
994.5
962
951
939.5
939.5
939.5
939.5
                                                                                                                                                                                                                                                                                                                 Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2:
4:
5:
7:
9:
                                                                                                                                                                                                                                                                                                               Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-10-007-521-12
1659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         July 7, 2004, 08:46:10 ; Search time 51 Seconds (without alignments)
1824.978 Million ceil updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1276540 seqs, 311283816 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 MRSTPVLRTTLAAALPLVAS.....TTCVSGTTCQKLNDYYSQCL 299
100.0
73.3
69.9
69.9
67.6
62.6
62.6
62.6
63.9
59.9
58.0
59.9
59.9
59.9
59.9
59.9
59.9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Published_Applications_AA:*
1: /cgn2_6/ptodata/1/pubpaa/US07_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /cgn2_6/ptodata/1/pubpaa/US09A PUBCOMB.pep:*
/cgn2_6/ptodata/1/pubpaa/US09B PUBCOMB.pep:*
/cgn2_6/ptodata/1/pubpaa/US09B PUBCOMB.pep:*
/cgn2_6/ptodata/1/pubpaa/US09C PUBCOMB.pep:*
/cgn2_6/ptodata/1/pubpaa/US10A PUBCOMB.pep:*
/cgn2_6/ptodata/1/pubpaa/US10B PUBCOMB.pep:*
/cgn2_6/ptodata/1/pubpaa/US10B PUBCOMB.pep:*
/cgn2_6/ptodata/1/pubpaa/US10C NEW_PUB.pep:*
/cgn2_6/ptodata/1/pubpaa/US10C NEW_PUB.pep:*
/cgn2_6/ptodata/1/pubpaa/US0C NEW_PUB.pep:*
/cgn2_6/ptodata/1/pubpaa/US0C NEW_PUB.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgn2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgm2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgm2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgn2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgn2_6/ptodata/1/pubpaa/PCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cgil
                                                                                                                                                                                                                                                                                                                 Length DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  m2_6/ptodata/1/pubpaa/PCT_NEW_PUB.pep:*
m2_6/ptodata/1/pubpaa/USO6_NEW_PUB.pep:*
m2_6/ptodata/1/pubpaa/USO6_PUBCOMB.pep:*
m2_6/ptodata/1/pubpaa/USO7_NEW_PUB.pep:*
m2_6/ptodata/1/pubpaa/PCTUS_PUBCOMB.pep:*
m2_6/ptodata/1/pubpaa/USO8_NEW_PUB.pep:*
m2_6/ptodata/1/pubpaa/USO8_NEW_PUB.pep:*
14 US-10-007-521-12
15-10-369-499-4204
15-10-369-499-4204
15-10-369-499-4204
15-10-138-870-2
16-10-138-870-2
16-10-138-870-2
16-10-007-521-6
16-10-007-521-4
16-10-007-521-8
17-10-007-521-8
18-10-007-521-8
18-10-007-521-8
18-10-007-521-8
18-10-007-521-8
18-10-007-521-8
18-10-007-521-8
18-10-007-521-8
18-10-007-521-8
                                                                                                                                                                                                                                                                                                                 IJ
                    US-10-138-870-4
US-09-261-329-4
US-10-007-521-24
                                                                                                                                                                                                                                                                                                                                                                          SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            _PUBCOMB.pep:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1276540
Sequence 12, Appli
Sequence 2, Appli
Sequence 2, Appli
Sequence 2, Appli
Sequence 5, Appli
Sequence 6, Appli
Sequence 6, Appli
Sequence 4, Appli
Sequence 8, Appli
Sequence 8, Appli
Sequence 4, Appli
Sequence 4, Appli
Sequence 4, Appli
Sequence 4, Appli
Sequence 24, Appli
                                                                                                                                                                                                                                                                                                                 Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 1
US-10-007-521-12
US-10-007-521-12
; Sequence 12, Application US/10007521
; Publication No. US20030054539A1
; GENERAL INFORMATION:
```

	Ġ	4	43	42	41	40	39	38										28	27	N O	25	24	23	22	21	20	19	18	17	ŀ
53.5 298 14 US-10-000 53.3 293 14 US-10-000 49.4 203 10 US-00-26 48.3 203 12 US-10-43 46.4 338 12 US-10-43 46.4 387 12 US-10-43 46.7 366 12 US-10-43 46.7 366 12 US-10-43 45.7 366 12 US-10-43 45.6 338 12 US-10-43 45.7 366 12 US-10-43 45.6 338 12 US-10-43 45.6 338 12 US-10-43 45.7 366 12 US-10-43 45.6 338 12 US-10-43 46.4 9 360 12 US-10-43 46.4 9 360 12 US-10-43 46.4 9 360 12 US-10-43 46.5 203 10 US-09-26 43.3 203 10 US-09-26 43.3 203 10 US-09-26 43.4 346 12 US-10-43 41.4 346 12 US-10-43 41.4 346 12 US-10-43 41.5 203 10 US-09-26	419	496	587	672	686.5	686.5	5.883	718	722.5	725	745	745	752.5	756.5	756.5	757.5	757.5	766.5	769.5	769.5	769.5	769.5	777	792.5	796.5	801.5	819	884	887	001
14 US-10-000 16 US-99-26 17 US-10-43 18 US-10-43 19 US-10-43 10 US-99-26 10 US-99-26 11 US-10-43 11 US-10-43 12 US-10-43 13 US-10-43 14 US-10-43 15 US-10-43 16 US-99-26 17 US-10-43 17 US-10-43 18 US-10-43 19 US-10-43 19 US-10-43 10 US-99-26	25.3	29	35	40	41	41	41.5	43.3	43.6	43.7	44.9	44.9	45.4	45.6	45.6	45.7	45.7	46.2	46.4	46.4	46.4	46.4	46.8	47.8	48.0	48.3	49.4	ŝ	بر	ţ
US-10-000 US-10-000 US-10-000 US-10-431 US-10-	211	235	138	203	346	346	226	203	202	222	360	360	202	338	338	366	366	245	38.7	387	338	338	205	228	225	223	203	293	298	-
-10-000 -10-000 -10-433 -10-433 -10-433 -10-431 -10-632 -10-63	10	10	14	10	12	12	14	10	10	14	12	12	10	12	12	12	12	12	12	12	12	12	10	12	14	12	10	14	14	1
	US-09-261-329-11	US-09-261-329-10	-10-00	-09-26	-10-43	-10-416	-10-00	-09-26	-09-26	-10-007-521-	-10-432-290-	-10-416-32B-	-261-329-	US-10-432-290-1	US-10-416-328-1	US-10-432-290-3	-416-328-	-432-290-	-432-290-	-10-416-328-	-10-432-290-	-10-416-328-		7	-10-007-521-	-10-432-290-	-09-261-329	10-007-521-	-10-007-521-	4 9 1 4 4 4 4 4
	11, App.	7	26, App1	20	÷	6, Appl:	_	9, Appli	2, Appl		5, Appli		•	1, Appli	1, Appli	3, Appli	2, Appli	29, Appi	9, Appli		7, Appl:	4, Appl:	7, Appl:	24, App1	Z, Appi		6, Appli			

ALIGNMENTS

APPLICANT: Schulein, Martin

```
COMPUTER READABLE FORM:

MEDIUM TYPE: Ploppy disk

COMPUTER: IBM PC compatible

COMPUTER: IBM PC compatible

COMPUTER: PC - DOS/MS - DOS

SOFTWARE: Patentin Release #1.0,

CURRENT APPLICATION DATA:
                                                            PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/08/651,136
FILING DATE: 21-MAY-1996
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Takagi, Shinobu
TITLE OF INVENTION: No. US20030054539Alel Endoglucanases
                                                                                                                                                                                                                                                                                                                                                                                    STATE: New York
COUNTRY: United States of America
ZIP: 10174-6401
                                                                                                                                                             APPLICATION NUMBER: US/10/007,521
FILING DATE: 10-Dec-2001
CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADDRESSEE: No. US20030054539Alo No. US20030054539Aldisk of No. US200300: STREET: 405 Lexington Avenue, 64th Floor
                    NAME: Lambiris, Elias J. REGISTRATION NUMBER: 33,728
                                                                                                                                                                                                                                                                                                                                                                                                                                                         CITY: New York
REFERENCE/DOCKET NUMBER: 4366.200-US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OF SEQUENCES: 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Andersen, benefit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nielsen, Ruby I.
Ihara, Michiko
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Kauppinen, Markus S
Lange, Lene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Lene N.
                                                                                                                                                                                                                                                                     Version #1.30
```

```
; TYPE: amino acid
; TOPOLOGY: linear
; MOLECULE TYPE: protein
SEQUENCE DESCRIPTION: SEQ ID NO: 12:
US-10-007-521-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             멼
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ϋ́
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
 밁
                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-10-369-493-4204
                                                                                                                                             US-10-369-493-4204
                                                                                                                                                                                                                                                                    CURRENT APPLICATION NUMBER: US/10/369,493
CURRENT FILING DATE: 2003-02-28
PRIOR APPLICATION NUMBER: US 60/366,039
PRIOR FILING DATE: 2002-02-21
NUMBER OF SEQ ID NOS: 47374
SEQ ID NO 4224
LENGTH: 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Cao, 1
APPLICANT: Hinkl
APPLICANT: Slate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 4204, Application US/10369493
Publication No. US20030233675A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                     Best Local Similarity
Matches 215; Conserv
                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                              TITLE OF INVENTION: EXPRESSION OF MICROBIAL PROTEINS IN PLANTS FOR PRODUCTION TITLE OF INVENTION: PLANTS WITH IMPROVED PROPERTIES FILE REFERENCE: 38-10(52052)B
                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: Hinkle, Gregory J.
APPLICANT: Slater, Steven C.
APPLICANT: Goldman, Barry S.
APPLICANT: Chen, Xianfeng
                                                                                                                                                            NAME/KEY: unsure
LOCATION: (1)...(296)
OTHER INFORMATION: unsure at all Xaa locations
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELEPHONE: 212-867-0123
TELEFAX: 212-878-9655
INFORMATION FOR SEQ ID NO: 12:
                                                                                                                                                                                                                 FEATURE:
                                                                                                                                                                                                                                TYPE: PRT
ORGANISM: Neurospora crassa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELECOMMUNICATION INFORMATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        299;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61 LSDFNVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGP 120
                                   Ü
FPAPLKPGCQMRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFPVFTPPSGGNG 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDS 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LSDENVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGF 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MRSTPVLRTTLAAALPLVASAASGSGQSTRYMDCCKPSCAMPGKAAVSQPVYACDANEQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTGTPTSTAPGSGQTSPGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTGTPTSTAPGSGCTSPGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FPAPLKPGCQWREDWFQNADNPTFTFQQVQCPABIVARSGCKRNDDSSFPVFTPPSGGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLFGAQYGGISSRDQCDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Yongwei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100.0%;
                                                                     73.3%; Score 1216; DB 15
71.2%; Pred. No. 3.5e-94;
tive 27; Mismatches 36
                                                                   27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1659;
Pred. No. 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.9e-131;
                                                                                                       DB 15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 299;
                                                                       Indels
                                                                   24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               240
 60
                                   74
```

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        뭉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 3
US-09-735-787-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 2, Application US/09735787
Patent No. US20010036910A1
GENERAL INFORMATION:
APPLICANT: Rasmussen, Grethe
Query Match
Best Local Similarity
Matches 206; Conserv
                                                                                                                                                                                            TELEPHONE: 212-867-0123
TELEPAX: 212-878-9655
INFORMATION FOR SEQ ID NO: 2:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SHAVER STATES OF SHAVER STATES ON STATES ON STATES SEE: NO. US20010036910A10 NO. ADDRESSEE: NO. US20010036910A10 NO. ADDRESSEE: NO. US20010036910A10 NO. ADDRESSEE: NO. US20010036910A10 NO.
                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOSTMARE: Patentin Release #1.0, Version
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/735,787
FILING DATE: 13-Dec-2000
CLASSIFICATION: «Unknown»
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION: A Cellulase Preparation Comprising Endoglucanase Enzyme
                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: 09/189,028
FILING DATE: <UNKNOWN>
ATTORNEY/AGENT INFORMATION:
NAME: Lambiris, Elias J.
                                                                                             MOLECULE TYPE: protein SEQUENCE DESCRIPTION: SEQ ID
                                                                                                                                                                                                                                                                       REFERENCE/DOCKET NUMBER: TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      295 QC 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241 GGGSNPSTPT-TPPSS-----GGGSGCTADKYAQCGGSGWSGCTNCPSGSTCKTINDYYH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TSGPVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRD 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACY-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QCDSFPAPLKPGCQWRFDWFQNADNPTETFQQVQCPABIVARSGCKRNDDSSFPVFTPPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AYTCANNSPWAVNDQLSYGFAATKLSGGTESSWCCACYAXVSLQLLGITRWLTFTAALTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GSNGGTGTPTSTAPGSGQTSPGGGSGCTSQKWAQCGGTGESGCTTCVSGTTCQKLNDYYS 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QCDSFPAALKPGCQWREDWFQNADNPNETFKQVQCPSELTSRTGCKRNDDSQFPVFTPPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TSGPVAGKTLVVQSTSTGGDLGSNHFDINMPGGGVGLFDGCKRQFGGLFGAQYGGISSRS 180
                                                                                                                                 LENGIH: 305 amino acids
TYPE: amino acid
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COUNTRY: United States of America ZIP: 10174-6401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STATE: New York
                                                                                                                                                                                                                                                                                                                REGISTRATION NUMBER: 33,728
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Patkar, ...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mikkelsen, Jan Moller
Schulein, Martin
Patkar, Shankant A.
                    69.9%;
  ; Score 1159; DB 9;
; Pred. No. 2.3e-89;
44; Mismatches 47;
                                                                                                 ŝ
                                                                                                                                                                                                                                                                                              3469.214-US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     . US20010036910Aldisk of No. US200100: Floor
                                        Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ALTF 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     236
```

Conservative

10;

Gaps

58

238

```
RESULT 4
US-10-138-870-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 2, Application US/10138870 Publication No. US20030119167A1 GENERAL INFORMATION:
                                                                                                               INFORMATION FOR SEQ ID NO: 2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: IBM PC compatible

OPERATING SYSTEX: PC-DOS/MS-DOS

SOFTWARE: PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CORRESPONDENCE ADDRESS:
ADDRESSEE: No. US20030119167Alo No. US20030119167Aldisk of No. US20030119:
STREET: 405 Lexington Avenue, 64th Floor
                                                                                                                                                                                                                                                      APPLICATION NUMBER: US/09/735,787
FILING DATE: 13-Dec-2000
APPLICATION NUMBER: 09/189,028
FILING DATE: <UNKnown>
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE OF INVENTION: A Cellulase Preparation Comprising Endoglucanase Enzyme
                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US/10/135,870
FILING DATE: 03-May-2002
CLASSIFICATION: «Unknown»
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
MOLECULE TYPE: protein SEQUENCE DESCRIPTION: SEQ ID NO:
                                                                       SEQUENCE CHARACTERISTICS:
LENGTH: 305 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION DATA:
                                                                                                                                                       TELECOMMUNICATION INFORMATION:
TELEPHONE: 212-867-0123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANPQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RFPDALKPGCYWREDWFKNADNPSFSFRQVQCPAELVARTGCRRNDDGNFPAVQIPSSST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEPAPLKPGCOMREDWEQNADNETETEQQVQCPABIVARSGCKRNDDSSFP-VETPPSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PVAGKTMVVQSTSTGGDLGSNQFDIAM>GGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LSDENVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTF7SG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ITDEDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTETSG 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DYYSCCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SSPVNOPTSTSTTSTSTSSSPPVOPTTPSGCTARRHAQCGGNGWSGCTTCVAGSTCTKIN 298
            TOPOLOGY: linear
                                                                                                                                                                                               NAME: Lambiris, Elias J.
REGISTRATION NUMBER: 33,728
REFERENCE/DOCKET NUMBER: 3469.214-US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COUNTRY: United States of America ZIP: 10174-6401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CITY: New York
STATE: New York
                                                                                                                                      TELEFAX: 212-878-9655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mikkelsen, Jan Rolle
Schulein, Martin
Patkar, Shankant A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rasmussen, Grethe
                                                        amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Patkar, Sha
Hagen, Fred
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Jan Moller
Ņ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENERAL INFORMATION:
APPLICANT: Andersen, Kim
APPLICANT: Schulein, Martin
APPLICANT: Christiansen, Lars
APPLICANT: Christiansen, Lars
APPLICANT: Under Osten, Claus
ITILE OF INVENTION: Cellulase Variants
ITILE REFERENCE: 4887.204-US
CURRENT FILING DATE: 1999-03-03
ERALIER APPLICATION NUMBER: US/09/261,329
CURRENT FILING DATE: 1999-03-03
ERALIER APPLICATION NUMBER: 1013/96
ERALIER APPLICATION NUMBER: 1013/96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ő
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                              Ş
                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 5
US-09-261-329-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-10-138-870-2
                     S
                                                             믕
                                                                                                Ş
                                                                                                                                           밁
                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                       US-09-261-329-5
                                                                                                                                                                                                                                                                                                                                                                                                                                             NUMBER OF SEQ ID NOS: 26
SOFTWARE: FastSEQ for Windows Version 3.0
SEQ ID NO 5
LENGTH: 201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 5, Application US/09261329
Publication No. US20030092097A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches 206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                            Query Match
Best Local :
                                                                                                                                                                                                                                                                                                           Matches 200;
                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: PRT ORGANISM: Cellulase variants
                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       293 DYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       239 NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           180 SFPAPLKPGCQWREDWFQNADNPTFTFQQVQCPABIVARSGCKRNDDSSFP-VFTPPSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120 PVASKTMVVQSTSTGGDLGSNQPDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                       204
                                                                                  144 IAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDSFPAPIKPGCQWREDWFQNADNPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 84 WAVADNIAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMVVQSTSTGGDLGSNQFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     24 GSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQRLSDFNVQSGCNGGSAYSCADQTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 MRSTPVLRTTLAAALPIVASAASGSGOSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ITDFDAKSGCEPGGVAYSCADQTPWAVNDDFALGFAATSIAGSNEAGWCCACYELTFTSG 118
FTFQQVQCPABIVARSGCKR 223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    рмуност зо5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SSPVNQPTSTSTTSTSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD 178
                                                           IAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDSFPAPLKPGCQWRFDWFQNADNPT 180
                                                                                                                                                                                                                               GSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQRLSDFNVQSGCNGGSAYSCADQTP 60
                                                                                                                                             WAVNDNLAYGFAATSIAGGSESSWCCACYALTFISGPVAGKTMVVQSTSTGGDLGSNQFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69.9%; Score 1159; DB 14; illarity 67.1%; Pred. No. 2.3e-89; Conservative 44; Mismatches 47;
                                                                                                                                                                                                                                                                                                       67.6%; Score 1122; I ilarity 100.0%; Pred. No. 1.8 Conservative 0; Mismatches
                                                                                                                                                                                                                                                                                                           Score 1122; DB 10;
; Pred. No. 1.8e-86;
0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 305;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                   Length 201;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10;
                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                               Gaps
```

120

143

83

203

Q 밁 δ g 8 멅 S 밁 8 Ŋ,

밁

181

FTFQQVQCPAEIVARSGCKR 200

US-08-841-636A-31

Sequence 31, Application US/08841636A Publication No. US20020168751A1

GENERAL INFORMATION

```
PRIOR APPLICATION DATA:
APPLICATION NUMBER: PCT/FI9)
FILING DATE: 17-OCT-1996
ATTORNEY/AGENT INFORMATION:
NAME: Timothy J. Shea, Jr.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FILING DATE: 17-OCT-1995
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 60/
FILING DATE: 04-DEC-1995
PRIOR APPLICATION DATA:
                                                                                                  TOPOLOGY: line
MOLECULE TYPE: p
ORIGINAL SOURCE:
                                                                                                                                                                                                           TELEFAX: (202)371-2540
NFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 60/005,335
FILING DATE: 17-CCT-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ZIP: 20005
COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette, 3.50 inch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE OF INVENTION:
                                                                                                                                                                                                                                                                            REFERENCE/DOCKET NUMBER: 1716.0510005/MAC/TJS
                                                                                                                                                                                                                                                                                                                                                                                                                         PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 0:
FILING DATE: 16-OCT-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOPTWARE: PatentIn Release #1.0, Version #1.30 (EPO) CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER: IBM PC OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STREET: 1100 New CITY: Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US/0 FILING DATE: 30-APR-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: FILING DATE: 28-JU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
OTHER INFORMATION:
                                                                  STRAIN: ALKO4237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ADDRESSEE: Sterne, Kessler, Goldstein & Fox P.L.L.C. STREET: 1100 New York Avenue, N.W., Suite 600
                  LOCATION:
                               NAME/KEY: Protein
                                                                                     ORGANISM:
                                                                                                                                                         STRANDEDNESS:
                                                                                                                                                                                                                                                                 TELEPHONE:
                                                                                                                                                                                                                                                                                                                 REGISTRATION NUMBER: 41,306
                                                                                                                                                                                          ENGTH:
                                                                                                                                                                            amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Elovainio, Minna
Joutsjoki, Vesa
Paloheimo, Marja
Suominen, Pirkko
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Miettinen-Oinonen, Al
Londesborough, John
Vehmaanper, Jari
Haakana, Heli
                                                                                                                                                                                            235 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  M ntyl , Arja
Lantto, Raija
                                                                                                                                                                                                                          (202)371-2540
(202)371-0; 31:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
                                                                                                                                         linear
                                                                                   Melanocarpus albomyces
                                                                                                                    protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              28-JUN-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NOVEL CELLULASES,
USES THEREOF
/label= 20K-cellulase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US 60/007,926
                                                                                                                                                                                                                                                                                                                                                                                         PCT/F196/00550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US 60/020,840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US/08/841,636A
                                                                                                                                                                                                                                                                                                                                                                                                                                           US 08/732,181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Arja
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               THE GENES ENCODING THEM AND
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-08-841-636A-31
TOPOLOGY: linear
MOLECULE TYPE: protein
SEQUENCE DESCRIPTION: SEQ ID NO:
US-10-007-521-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 븅
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-10-007-521-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 6, Application US/10007521
Publication No. US20030054539A1
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches 180;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match 62.6%; Score 1039; DB 8; Best Local Similarity 76.3%; Pred. No. 2.1e-79;
                                                                                                                                                                      INFORMATION FOR SEQ ID NO: 6:
                                                                                                                                                                                                                                                                                                                                                         PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/08/651,136
FILING DATE: 21-MAY-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ZIP: 10174-6401
COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
ADDRESSEE: No. US20030054539Alo No. US20030054539Aldisk of No. US200300
STREET: 405 Lexington Avenue, 64th Floor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Nielsen, Ruby I.
Ihara, Michiko
Takagi, Shinobu
TITLE OF INVENTION: No. US20030054539Alel Endoglucanases
                                                                                                                                              SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                               REGISTRATION NUMBER: 33,728
REFERENCE/DOCKET NUMBER: 4366.200-US
TELECOMPUNICATION INFORMATION:
TELEPHONE: 212-867-0123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                    ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121 VAGKTMVVQSTSTGGDIGSNQFDIAMPGGGVGIFNGCSSQFGGIFGAQYGGISSRDQCDS 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               179 FPEPLKPGCOWREDWFONADNPSFTFERVOCPEELVARTGCRRHDDGGFAVFKAPS 234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181 PPAPLKPGCQWRFIWFQNADNPTFTFQQVQCPABIVARSGCKRNDDSSFPVFTPPS 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        119 VAGKTMVVQSTSTGGDLGSNHFDLNIPGGGVGLFDGCTPQFGGLPGARYGGISSRQECDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               59 IHDFDAVSGCEGGPAFSCADHSPWAINDNLSYGFAATALSGQTEESWCCACYALTFTSGP 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61 LSDENVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 MRSTEVLRALLAAALPLGALAA--NGQSTRYWDCCKPSCGWRGKGPVNQPVYSCDANFQR
                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: US/10/007,521
FILING DATE: 10-Dec-2001
CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CITY: New York
STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COUNTRY: United States of America
                                                                                                     TYPE: amino acid
                                                                                                                        LENGTH: 308 amino acids
                                                                                                                                                                                               TELEFAX: 212-878-9655
                                                                                                                                                                                                                                                                                                              NAME: Lambiris, Elias J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Schulein, Martin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Andersen, Lene N
Lassen, Soren F.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Kauppinen, Markus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lene N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     27; Mismatches
                                 6.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 235;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                58
```

```
US-10-007-521-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 4, Application US/10007521
Publication No. US20030054539A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 185; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL INFORMATI
                            TELEFAX: 212-878-9655
INFORMATION FOR SEQ ID NO: 4:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ьосаl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Takagi, Shinobu
TITLE OF INVENTION: No. US20030254539A1el Endoglucanases
NUMBER OF SEQUENCES: 109
                                                                                                                                                                                                                                                                                                                                                                                             FILING DATE: 10-Dec-2001
CLASSIFICATION: <Unknown>
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SCFTMARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
ADDRESSEE: No. US2003:054539A10 No. US2003:054539A1disk of No. US2003:054539A10 No. US2003:054500 No. US2003:05450 No. US2003:05450 No. US2003:05450 No. US2003:05450 No. US2003:05540 No. US2003:0
                                                                                                                                                                                                                                                                                          APPLICATION NUMBER: US/08/651,136
FILING DATE: 21-MAY-1996
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                           NAME: Lambiris, Elias J.
REGISTRATION NUMBER: 33,728
REFERENCE/DOCKET NUMBER: 4366.200-US
TELECOMMUNICATION INFORMATION:
TELEPHONE: 212-867-0123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        183 APLKPGCQWRFDWFQNADNFTFTFQQVQCPAEIVARSGCKRNDDSSFP-VFTFPSGGNGG 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          305 HQCL 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             245 VNQPTSTSTTSTSTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKINDWY 304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              126 MVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLP---GAQYGGISSRDQCDSFP 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         65 RSGCDAGGSAYMCSSQSPWAVSDELSYGWAAVKLAGSSESQWCCACYELTFTSGPVAGKK 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     67 QSGCN-GGSAYSCADQTPWAYNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKT 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9 TILAAALDLVA-SAASGSQSTRYWDCCXPSCAWPGKAAVSQPVYACDANFQRLSD-FNV 66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TGTPTSTAPGSGQTS-----PGGGSGCTSQXWAQCGGIGFSGCTTCVSGTTCQXLNDYY 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EALKPGCNWRFDWFQNADNESYTFQEVACPSELTSKSGCSRNDDGNFPAVQIPSSSTSSP 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MIVQATNTGGDLGDNHFDLAIPGGGVGIFNACTDQYGAPPNGWGDRYGGIHSKEECESFP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TTGFLALPVLALDQLSGIGQTTRYWDCCKPSCAWPGKGP-SSPVQACDKNDNPLNDGGST 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CITY: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: US/10/007,521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ZIP: 10174-6401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COUNTRY: United States of America
LENGTH: 297 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Lange, Lene
Nielsen, Ruby I
Ihara, Michiko
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Schulein, Martin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Kauppinen, Markus S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Lassen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Soren F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ruby I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Lene N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              43; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 1021; DB 14; Length 308; Pred. No. 9.4e-78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 14; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-10-007-521-22
; Sequence 22, Application US/10007521
; Publication No. US20030054539A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-10-007-521-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches 181; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
          INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: PatentIn Release #1.0,
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/10/007,521
FILING DATE: 10-Dec-2001
CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE DESCRIPTION: SEQ ID NO: 4:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE: protein
                                                                                                                                                                                                                                         PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/08/651,136
FILING DATE: 21-MAY-1996
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
ADDRESSEE: No. US20030054539Alo No. US20030054539Aldisk of No. US2003005
STREET: 405 Lexington Avenue, 64th Floor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE OF INVENTION: NO. NUMBER OF SEQUENCES: 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: Schulein, Martin
                                                                                                             TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       243 TSTSTTSSPPVQPTTP---SGCTAERWAQCGGNGWSGCTTCVAGSTCTKINDWYHQCL 297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              185 EALKPGCNWRFDWFQNADNPSVTFQEVACPSELTSKSGCSRPSSSTSSPVNQPTS--TST 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          183 APIKPGCOWREDWEONADNETETEOQVOCPARIVARSGCKR-NDDSSEPVETPPSGGNGG 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                125 MIVQATNTGGDLGDNHFDLAIPGGGVGIFNACTDQYGAPPNGWGDRYGGIHSKEECESFP 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         126 WVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLP---GAQYGGISSRDQCDSFF 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
Ui
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    67 QSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKT 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9 TILAAALPIVA-SAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQRLSD-FNV 66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RSGCDAGGSAYMCSSQSPWAVSDELSYGWAAVKLAGSSESQWCCACYELTFTSGPVAGKK 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TGTPTSTAPGSGQTSPGGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TIGFLALPVLALDQLSGIGQTIXYWDCCXPSCAMPGKGP-SSPVQACDXNDNPLNDGGST 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CITY: New York
STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COUNTRY: United States of America ZIP: 10174-6401
          TELEPHONE: 212-867-0123
TELEFAX: 212-878-9655
NN FOR SEQ ID NO: 22:
                                                                                                                                      NAME: Lambiris, Elias J.
REGISTRATION NUMBER: 33,728
REFERENCE/DOCKET NUMBER: 4366.200-US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Takagi, Shinobu
WENTION: No. US20030054539A1el Endoglucanases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Nielsen, Ruby
Ihara, Michiko
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Lange, Lene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Kauppinen, Markus S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Andersen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               lassen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            59.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Soren F.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ruby I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lene N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 994.5; DB 1
Pred. No. 1.5e-75;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 14; Length 297;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
```

S 당 Ś 문 Š 뮍 S 망 Ś ğ

```
RESULT 10
US-10-007-521-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-10-007-521-22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 8, Application US/10007521 Publication No. US20030054539A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 175; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 58.0%;
Best Local Similarity 55.9%;
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/08/651,136
FILING DATE: 21-MAX-1996
ATTORNEY/AGENT INFORMATION:
NAME: Lambiris, Elias J.
                                                                                                               CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/10/007,521
FILING DATE: 10-Dec-2001
CLASSIFICATION: «Unknown»
                                                                                                                                                                                                        COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Takagi, Shinobu
TITLE OF INVENTICA: No. US20030054539Alel Endoglucanases
NUMBER OF SEQUENCES: 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MOLECULE TYPE: protein SEQUENCE DESCRIPTION: SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  179 DSFPAPLKPGCQWREDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFPVFTPP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    116 PVAGKTMVVQSTNTGGDLSGNHFDILMPGGGLGIFDGCTPQWGVSFPGNRYGGTTSRSQC 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           120 PVAGKTMVVQSTSTGGDLGSNQFDLAMPGGGVGLFNGCSSQFG-GLPGAQVGGISSRDQC 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      286 TTCQKLNDYYSQC 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61 LSDENVQSGC-NGGSAYSCADQTPWAYNDNLAYGFAATSIAGGSESSWCCACYALTFTSG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STCSVVNPWYSQC 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATTIRTSTTITASSSSSSSSSSTTAGSPPVPTGGGSGPTSPVWGQCGGQGWSGPTRCVAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----SGGNGGTGTFTSTAPGSGQTSPGGGSGCTSQKWAQCGGTGFSGCTTCVSG 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SQIPSALQPGCNWRYDWPNDADNPDVSWRRVQCPAALTDRTGCRRSDDGNYPVFQPGPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LAS-TARSGCDSNGVÄYTCNDNQFWAVNDNLAYGFAATAFSGGSEASWCCACYALQFTSG 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MRSSAVLIGIVAG----VAAQSSGTGRTTRYWDCCKPSCGWDEKASVSQPVKTCDRYNNP 56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                STATE: New York
COUNTRY: United States of America
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                CITY: New York
                                                                                                                                                                                                                                                                                                                                                                                                                   STREET: 405 Lexington Avenue, 64th Floor
                                                                                                                                                                                                                                                                                                                            ZIP: 10174-6401
                                                                                                                                                                                                                                                                                                                                                                                                                                              ADDRESSEE: No. US20030054539Alo No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LENGIH: 310 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Nielsen, Ruby I.
Ihara, Michiko
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Schulein, Martin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Lange, Lene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lassen, Soren F.
Kauppinen, Markus S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Andersen, Lene N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 46; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 962; DB 14;
Pred. No. 8.7e-73;
6; Mismatches 72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       22:
                                                                                                                                                                                                                                                                                                                                                                                                                                              US20030054539Aldisk of No. US200300545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 310;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 11
US-09-735-787-4
; Sequence 4, Application US/09735787
; Patent No. US20010036910A1
; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    뭉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-10-007-521-B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEFAX: 212-878-9655
INFORMATION FOR SEQ ID NO: 8:
SEQUENCE CHARACTERISTICS:
                                                                                                COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                       ZIP: 10174-6401
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE OF INVENTION: A Cellulase Preparation Comprising Endoglucanase Enzyme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Rasmussen, Grethe
            PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                       NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     293 1 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              299 L 299
                               APPLICATION NUMBER: US/09/735,787
FILING DATE: 13-Dec-2000
CLASSIFICATION: Unknown>
                                                                                                                                                                                                                                                                                                                                 ADDRESSBE: No. US20010036910Alo No. US20010036910Aldisk of No. US200100 STREET: 405 Lexington Avenue, 64th Floor
                                                                                                                                                                                                                                                                  COUNTRY: United States of America
                                                                                                                                                                                                                                                                                        STATE: New York
                                                                                                                                                                                                                                                                                                                CITY: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mikkelsen, Jan Moller
Schulein, Martin
Patkar, Shankant A.
Hagen, Fred
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Jan Moller
```

an

밁 Ş 믕 \$ 밁 Ŕ

```
Query Match 57.3%; Score 951; DB 14; Best Local Similarity 58.5%; Pred. No. 6.9e-72; Matches 176; Conservative 37; Mismatches 78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE: protein
SEQUENCE DESCRIPTION: SEQ ID NO: 8:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REGISTRATION NUMBER: 33,728
REFERENCE/DOCKET NUMBER: 4366.200-US
TELECOMMUNICATION INFORMATION:
233 TGTPPTPTTTTSSPPQPTNGGGGGTSPHWGQCGGQGWSGPTACAGGSTCNLINPWYSQC
                                                   239 NGGTGTPTSTAPGSGQTSPGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLNDYYSQC 298
                                                                                                                176 AELPSVLRDGCHWRYDWFNDADNPNVNWRRVRCPAALTNRSGCVRNDDNSYPVFEP---G
                                                                                                                                                                    179 DSFPAPLKPGCOWREDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFPVFTPPSGG 238
                                                                                                                                                                                                                                    116 PVAGKIMVVQSTNTGGDLSGTHFDIQMPGGGLGIFDGCTPQFGFTFPGNRYGGTTSRSQC
                                                                                                                                                                                                                                                                   120 PVAGKTMVVQSTSTGGDLGSNQFDIAMFGGGVGIFNGCSSQFG-GLFGAQYGGISSRDQC 178
                                                                                                                                                                                                                                                                                                                                                                                   61 LSDFNVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTETSG 119
                                                                                                                                                                                                                                                                                                                                                        57 LSPGAV-SGCDPNGVAFTCNDNQPWAVNNNVAYGFAATAFPGGNEASWCCACYALQFTSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MRSTSILIGLVAG----VAAQSSGSGHTTRYWDCCKPSCAWDEKAAVSRPVTTCDRNNSP 56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEPHONE: 212-867-0123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JENGTH: 295 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 295;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                           115
                                                                                                                         232
                                                                                                                                                                                                                                             ∴75
```

Ş

F

맔 Ş 맒

#1.30

```
RESULT 12
US-10-138-870-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-735-787-4
                                                                                                                                                                                                                                                                                                                                                                                          Sequence 4, Application US/10138870 Publication No. US20030119167A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match 56.6%;
Best Local Similarity 49.5%;
Matches 183; Conservative 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INFORMATION FOR SEQ ID NO: 4:
                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
COUNTRY: United States of America
ZIP: 10174-6401
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                      Hagen, Fred
TITLE OF INVENTION: A Cellulase Preparation Comprising
Endoglucanase Enzyme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MOLECULE TYPE: protein SEQUENCE DESCRIPTION: SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELECOMMUNICATION INFORMATION:
                                                                                                                               CORRESPONDENCE ADDRESS:
ADDRESSEE: No. US20030119167Alo No. US20030119167Aldisk of No. US20030119:
STREET: 405 Lexington Avenue, 64th Floor
                                                                                                                                                                                               NUMBER OF SEQUENCES: 33
                                                                                                                                                                                                                                                                                                                                                   APPLICANT: Rasmussen, Grethe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5 TILALAGPLAVSAASGSGHSTRYWDCCKPSCSWSGKAAVNAPALTCDKNDNPISNTNAVN 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GC-NGGSAYSCADQTPWAVNDNIAYGFAATSIAGGSESSWCCACYALTETSGPVAGKTYV 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PVNKPKTTQKVRGTKTRGSCPAKTDATAKASVVPAYYQCGGSKSAYPNGNLACATGSKCV 364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AKKTTSAAAAQPQKTKDSAPVVQKSSTKPAAQPEPTKPADKPQTDKPVATKPAATKPVQ 304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VOSTSTGGDIGSNOFDIAMPGGGVGIFKGCSSOFG-GLEGAQYGGISSRDQCDSFPAPLK 186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCEGGGSAYACTNYSPWAVNDELAYGFAATKISGGSEASWCCACYALTFTTGPVKGKKMI 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TTLAAALPLVASAASGSGQSTRYWDCCKPSCAWEGKAAVSQPVYACDANFQRLSDFNVQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGGSGCTSQK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DGCHWRFDWFENADNPDFTFSQVQCPKALLDISGCKRDDDSSFPAFKVDTSASKPQPSSS 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PGCQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFPVF-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VQSTNTGGDLGDNHFDLMMPGGGVGIFDGCTSEFGKALGGAQXGGISSRSECDSYPELLX 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEPHONE: 212-867-0123
TELEFAX: 212-878-9655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NAME: Lambiris, Elias J.
REGISTRATION NUMBER: 33,728
REFERENCE/DOCKET NUMBER: 3469.214-US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: 09/189,028 FILING DATE: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KLNDYYSQCL 299
                                                                                    CITY: New York
STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KONEYYSOCV 374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LENGTH: 376 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                 Mikkelsen, uan
                                                                                                                                                                                                                                                                 Schulein, Martin
Patkar, Shankant A.
Hagen, Fred
                                                                                                                                                                                                                                                                                                                                 Jan Moller
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   35; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 939.5; DB y; ~~~.
Pred. No. 8.5e-71;
""amatches 73; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----TPPS-----GGWGGTGTPTSTAPGSGQTSP 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----WAQCGGIGF---SGCTTCVSGTTCQ 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 376;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6
                         Sequence 4, Application US/09261329
Publication No. US20030092097A1
GENERAL INFORMATION:
APPLICANT: Andersen, Kim
APPLICANT: Schulein, Martin
APPLICANT: Christiansen, Lars
APPLICANT: Dangaard, Bo
APPLICANT: Von Der Oster, Claus
TITLE OF INVENTION: Cellulase Variants
                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뭐
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             뭕
                                                                                                                                                                                                                          US-09-261-329-4
                                                                                                                                                                                                                                               RESULT 13
                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                                                   맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; MOLECULE TYPE: protein ; SEQUENCE DESCRIPTION: SEQ ID NO: 4: US-10-138-870-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches 183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
         FILE REFERENCE: 4887.204-US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INFORMATION FOR SEQ ID NO: 4:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE/DOCKET NUMBER: 3469.214-US
TELECOMMUNICATION INFORMATION:
TELEPHONE: 212-867-0123
TELEFAX: 212-878-9655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATTORNEY/AGENT INFORMATION:
NAME: Lambiris, Elias J.
REGISTRATION NUMBER: 33,728
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOPTWARE: PatentIn Release #1.0, Version CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
LENGTH: 376 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                               365
                                                                                                                                                                                                                                                                                                                                                                                                     305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       128 VQSTSTGGDLGSNQFDIAMPGGGVGIENGCSSQFG-GLPGAQYGGISSRDQCDSFPAPLK 186
                                                                                                                                                                                                                                                                                                                                                          290
                                                                                                                                                                                                                                                                                                                                                                                                                                              258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9 TTLAAALELVASAASGSGQSTRYWDCCKPSCAWEGKAAVSQPVYACDANEQRLSDENVQS
                                                                                                                                                                                                                                                                                                                                                                                                 PVNKPKTTÓKVRGTKTRGSCPAKTDATAKASVVPAYYÓCGGSKSAYPNGNLACATGSKCV 364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: US/09/735,787
FILING DATE: 13-Dec-2000
APPLICATION NUMBER: 09/189,028
FILING DATE: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PGCQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFPVF------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCEGGGSAYACINYSPWAVNDELAYGFAATKISGGSBASWCCACYALTETTGPVXGKKMI 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GC-NGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMV 127
                                                                                                                                                                                                                                                                                                               KONEYYSOCV 374
                                                                                                                                                                                                                                                                                                                                                        KLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                              GGGSGCTSQK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AKKTTSAAAAAQPQKTKDSAPVVQXSSTKPAAQPEPTKPADKPQTDKPVATKPAATKPVQ 304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DGCHWRFDWFENADNPDFTFEQVQCPKALLDISGCKRDDDSSFPAFKVDTSASKPQPSSS 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VOSTNIGGDLGDNHFDLMMPGGGVGIFDGCTSEFGKALGGAQYGGISSRSECDSYPELLK 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TLLALAGPLAVSAASGSGHSTRYMDCCKPSCSWSGKAAVNAPALTCDKMDNPISNTNAVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FILING DATE: 03-May-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US/10/138,870
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        56.6%; Score 939.5;
49.5%; Pred. No. 8.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      35; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----TPPS-----GGNGGTGTPTSTAPGSGQTSP 257
```

8.5e-71; ches 73;

Indels

79;

Gaps

64 8 DB 14; Length 376;

밁 Ş, 망 S 밁 Ş 片 Ş 당 Ş Ц Ş 맒

--WAQCGGIGF---SGCTTCVSGTTCQ 289

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 14
US-10-C07-521-24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뭐
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-261-329-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EARLIER FILING DATE: 1996-09-17
NUMBER OF SEQ ID NOS: 26
SOFTWARE: FastSEQ for Windows Version 3.0
SEQ ID NO 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 24, Application US/10007521
Publication No. US20030054539A1
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION NUMBER: US/09/261,329
CURRENT FILING DATE: 1999-03-03
EARLIER APPLICATION NUMBER: 1013/96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LENGTH: 201
TYPE: PRT
ORGANISM: Cellulase variants
                                                                                                                                                              CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/10/007,521
FILING DATE: 10-Dec-2001
CLASSIFICATION: -Unknown>
PRIOR APPLICATION DATA:
                  REFERENCE/DOCKET NUMBER: TELECOMMUNICATION INFORMATION:
                                                        ATTORNEY/AGENT INFORMATION:
NAME: Lambiris, Elias J.
REGISTRATION NUMBER: 33,728
                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION: No. US20030054539A1el Endoglucanases NUMBER OF SEQUENCES: 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               144 IAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDSFPAPLKPGCQWREDWFQNADNPT 203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               158;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         24 GSGQSTRYWDCCKPSCAWPGKAAVSQFVYACDANFQRLSDFNVQSGCNGGSAYSCADQTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61 WAVNDNLAYGFAATKLSGGTESSWCCACYALTFTSGPVSGKTLVVQSTSTGGDLGSNHFD 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                84 WAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMVVQSTSTGGDLGSNQFD 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 GSGKSTRYWDCCKPSCAWSGKASVNREVLACDANNNPLNDANVKSGCDGGSAYTCANNSP 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                 ADDRESSEE: No. US20030054539Alo No. US20030054539Aldisk of No. US20030054
STREET: 405 Lexington Avenue, 64th Floor
CITY: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FIFKQVQCPSELTSRTGCKR 200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FTFQQVQCPAEIVARSGCKR 223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LWMPGGGVGLFDGCKREFGGLPGAQYGGISSRSECDSFPAALKPGCQWRFDWFKNADNPE 180
                                                                                                                        APPLICATION NUMBER: US/08/651,136 FILING DATE: 21-MAY-1996
                                                                                                                                                                                                                                                                         COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                               STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                   COUNTRY: United States of America ZIP: 10174-6401
TELEPHONE: 212-867-0123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Nielsen, Ruby I.
Ihara, Michiko
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Schulein, Martin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Lassen, Soren F.
Kauppinen, Markus S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Takagi, Shinobu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lange, Lene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Andersen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 56.5%; Score 938; DB 10; 79.0%; Pred. No. 5.6e-71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lene N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                        4366,200-US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 201;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0
```

```
TOPOLOGY: linear
; MOLECULE TYPE: protein
; SEQUENCE DESCRIPTION: SEQ ID NO: 24:
US-10-007-521-24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뮍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        묽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-10-007-521-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 10, Appropriate Publication No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches 169;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INFORMATION FOR SEQ ID NO: 24:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
APPLICANT: Schu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                          ZIP: 10174-6401

COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: IBM PC compatible

OPERATING SYSTEM: PC-DOS/MS-DOS

SOFTWARE: Patentin Release #1.0, Version #1.30

CURRENT APPLICATION DATA:
                                                         APPLICATION NUMBER: US/08/651,136
FILING DATE: 21-MAY-1996
ATTORNEY/AGENT INFORMATION:
                                                                                                                       PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES: 10 CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ihara, Michiko
Takagi, Shinobu
TITLE OF INVENTION: No. US20030054539Alel Endoglucanases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               246 SSPPVQPTTP---SGCTAERWAQCGGNGWSGCTTCVAGSTCTKINDWYHQCL 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             248 TAPGSGQTSPGGGSGCTSQXWAQCGGTGFSGCTTCVSGTTCQXLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      188 NWRFDWFENADNPTVDWEPVTCPQELVARTGCSRTPSSSTSSPVNQPTS--TSTTSTSTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         190 QWREDWFQNADNFTFTFQQVQCPAEIVARSGCKKNDDS--SFPVFTPFSGGNGGTGTFTS 247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              128 TNTGGDLGNNHFDIAMÞGGGVGIFNGCSKÓWNGINLGNÓYGGFTDRSÓCATLÞSKWOASC 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              131 TSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLF-GAQYGGISSRDQCDSFFAPLKPGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               71 NGGSAYSCADQTPWAVNDNIAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMVVQS 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13 AALPIVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDA--NFQRLSDFNVQSGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 68 DGGSAYYCSNQGFWAVNDSLSYGFAAAKLSGKQETDWCCGCYKLTFTSTAVSGKQMIVQI 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9 SALLLEPATEATSGVTTRYWDCCKPSCAWTGKASVSKPVGTCDINDNAQTPSDL-LKSSC 67
                                                                                                                                            APPLICATION NUMBER: US/10/007,521
FILING DATE: 10-Dec-2001
CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                  CITY: New York
STATE: New York
COUNTRY: United States of America
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                ADDRESSEE: NO. US20030054539A10 NO. US20030054539A1disk of No. US200300'sTREET: 405 Lexington Avenue, 64th Floor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEFAX: 212-878-9655
REFERENCE/DOCKET NUMBER: 4366.200-US
                    REGISTRATION NUMBER: 33,728
                                NAME: Lambiris, Elias J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Application US/10007521
No. US20030054539A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mielsen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Kauppinen, Markus S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Schulein, Martin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Lassen, Soren P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Andersen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               294 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                55.7%; Score 923.5; DB 14; Length 294; 57.9%; Pred. No. 1.4e-69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ьепе
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ruby I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Lene N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           43; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels '11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6,
```

```
TYPE: amino acid;
TOPOLOGY: linear;
MOLECULE TYPE: protein;
SEQUENCE DESCRIPTION: SEQ ID NO: 10:
US-10-007-521-10
                       8
                                                           문
                                                                                    Ş
                                                                                                                                               γQ
                                                                                                                                                                                                         S
                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                       δÃ
                                                                                                                    岁
                                                                                                                                                                                  ДĠ
                                                                                                                                                                                                                                                                                                      뫄
                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                 Query Match 54.9%; Score 910.5; DB 14; Length 349; Best Local Similarity 50.1%; Pred. No. 2.1e-68; Matches 168; Conservative 41; Mismatches 77; Indels 49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELECOMMUNICATION INFORMATION:
TELEPHONE: 212-867-0123
TELEPAX: 212-878-9655
INFORMATION FOR SEQ ID NO: 10:
SEQUENCE CHARACTERISTICS:
LENGTH: 349 amino acids
                            265
                                                           248
                                                                                         246
                                                                                                                       190
                                                                                                                                                    190
                                                                                                                                                                                  130
                                                                                                                                                                                                               131
308 VPLWGQCDSEASWDAEKKCAKGTKCVYVNDWYSQC 342
                                                                                                                                                                                                                                          SQKWAQCGG-IGFSGCTTCVSGTTCQKLNDYYSQC 298
                                                                                                                      QWRFDWFXNSDNPDIEFEQVQCPKELIAVSGCVRDDDSSFFVF--QSSGSGVNPPPKPT 247
                                                                                                                                         QWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFPVFTPPSGGNGGTGTP---- 245
                                                                                                                                                                              TNTGGDLSNNHFDLMIPGGGLGIFDGCSAÇFGQLLPGERYGGVSSRSQCDGMPELLKDGC 189
                                                                                                                                                                                                      TSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGG-LPGAQYGGISSRDQCDSFPAPIKFGC 189
                                                           TTTTSSKPKTTSÅPSTLSNPSAPQQPGNTDRPAETTTTKLPALPATTSSPAVSVPSSSAR 307
                                                                                       ----TSTAPG----SGQTSPGG-----
                                                                                         -----GSGCT 264
                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                    5
```

Search completed: July 7, 2004, 08:47:50 Job time : 52 secs

```
OM protein -
protein search, using sw model
                                                                     GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compugen Ltd.
```

Run on: July 7, 2004, 08:48:30 ; Search time 21 Seconds (without alignments) 1369.584 Million cell updates/sec

Title: Perfect score:

Sequence: US-10-007-521-12 1659 1 MRSTPVLRTTLAAALPLVAS.....TTCVSGTTCQKLNDYYSQCL 299

Scoring table: BLCSUM62

Gapop 10.0 , Gapext 0.5

283366 segs, 96191526 residues

Searched:

Total number of hits satisfying chosen parameters: 283366

Minimum DB seq length: 0
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries PIR_78:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:*

Database :

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

29	28	27										17	16	15	14	13		11	10	9					4.	ω	2	ц.	Result No.
129	137	137	139.5	141.5	143.5		150.5	156	161	170.5	170.5	172	181	183	184	185	188.5	189	190	203	214	215.5	219.5	219.5	221	462	507	740.5	Score
7.8	8 	8	ω 4	4		6		9.4	9.7	10.3	10.3	10.4	10.9	11.0	11.1	11.2	11.4		11.5				13.2	13.2	13.3	27.8		44.6	Query Match Le
418	839	438	540	530	388	388	960	856	504	511	510	320	516	537	516	525	302	464	516	463	459	513	513	513	242	393	511	229	Length I
سو	N	j	2	N	μ	μ	N	N	Н	N	N	Ν	N	_	N	۲	N	N	2	N	2	2	ν	Н	N	Ν	2	N	EB
\$28372	F75518	S70602	S41942	JC7979	S43920	JC5461	\$43846	T00349	B48939	S44716	S41943	JC1311	\$42093	JU0120	JS0083	\$38794	S71334	JC7143	S33164	A48375	A25928	S11439	\$45380	EUTQI	S60143	S59499	S10527	JC7308	ID
cellulase (EC 3.2.	cal pro		1,	~	cellulase (EC 3.2.	9	B - Tu		۲	1,4	-	1 prote	cellulose 1,4-beta	۳	cellulose 1,4-beta	cellulose 1,4-beta	acetyl xylan ester	endoglucanase I -		cellulase (EC 3.2.	(EC 3.	1,4-be	1,4.	cellulose 1,4-beta	(EC	_	endoglucanase B pr	3	Description

RESULT 2
S10527
endoglucanase B precursor - Pseudomonas fluorescens
C;Species: Pseudomonas fluorescens
C;Ste: 20-Feb-1995 #sequence_revision 20-Feb-1995 #text_change 08-Oct-1999
C;Accession: S10527
R;Gilbert, H.J.; Hall, J.; Hazlewood, G.P.; Ferreira, L.M.A.
Mol. Microbiol. 4, 759-767, 1990

45	44	43	42	41	40	9	8 8	37	36	(L)	'n.	3	32	1	G O
113.5	114	114	115.5	116.5	117	118.5	118.5	120	120.5	122	124	124	125.5	125.5	127
ъ. В	6.9	6.9	7.0	7.0	7.1	7.1	7.1	7.2	7.3	7.4	7.5	7.5	7.6	7.6	7.7
1381	1804	461	191	584	459	749	453	5376	303	182	471	471	410	316	429
N	N	N	N	N	Ŋ	2	'n	N	Ŋ	2	۲	ب	ப	ب	ب
E70806	H96597	T51044	I46412	G70804	JC7931	I38488	A41640	T42215	H70716	A36686	A38979	A26160	S68153	A38743	JC5861
hypothetical glyci	hypothetical prote	related to spore c	keratin KAP5.4 - s	hypothetical glyci	cellobiohydrolase	trophinin - human	vestigial protein	zonadhesin - mouse	hypothetical prote	ultra-high-sulfur	cellulose 1,4-beta	cellulose 1,4-beta	cellulase (EC 3.2.	loricrin - human	endo-1,4-beta-xyla

ALIGNMENTS

Db Qy	8 8	g Q	A, A	Query Masset Low Matches	RESULT 1 JC7308 c,Alternate N,Alternate C,Apecies: (C,Date: 18-) C,Accession R,Makatani, Biosci. Bio' A,Title: Cl- A,Reference A,Accession A,Molecule: A,Residues: A,Experimen A,Molecule: A,Rocession A,Molecule: A,Residues: A,Residues
181 FPAPLKPGCOMREDWEQNADNPTETEOQQVOCPABIVARSGCKRN 224	124 KTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDS 180 : : : :	66 V-QSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAG 123	10 TLAAALPIVASAASGSGQSTRYWDCCKESCAWPGKAAVSQ-PVYACDANFQRISDEN 65	Query Match 44.6%; Score 740.5; DB 2; Length 229; Best Local Similarity 59.8%; Pred. No. 2.6e-45; Matches 134; Conservative 32; Mismatches 49; Indels 9; Gaps 5;	RESULT 1 UC7308 Collulase (EC 3.2.1.4) - Scopulariopsis brevicaulis Collulase (EC 3.2.1.4) - Scopulariopsis brevicaulis C;Specias: Scopulariopsis brevicaulis C;Specias: Scopulariopsis brevicaulis C;Accession: UC7008 #Bequence revision 18-Aug-2000 #text_change 18-Aug-2000 C;Accession: UC7008, PC7087 - Text. R;Makatani, F.; Kawaguchi, T.; Takada, G.; Sumitani, J.; Moriyama, Y.; Arai, M. Biosci. Biotechnol. Biochem. 64, 1238-1246, 2000 A;Title: Cloning and sequencing of an endoglucanase gene from Scopulariopsis brevicau A;Reference number: JC7308 A;Accession: UC7308 A;Kolecule type: DNAK- A;Experimental source: strain TOF-1212 A;Accession: PC7087 A;Accession:

```
A;Cross-references: EMBL:X52615; NID:g45497; PIDN:CAA36844.1; PID:g45498 C;Superfamily: bacterial cellulose-binding domain homology: glycosidase (F;31-128/Domain: bacterial cellulose-binding domain homology cBCB> F;180-217/Domain: glycosidase GMGW domain homology cGWG> F;32-127/Disulfide bonds: #status predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-511 <GIL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Title: The N-terminal region of an endoglucanase from Reeudomonas fluorescens A;Reference number: S10527; MUID:90355836; PMID:2117693 A;Accession: S10527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R;Schauwecker, F.; Wanner, G.; Kahmann, R.
Biol. Chem. Hoppe-Seyler 376, 617-625, 1995
A;Tille: Filament-specific expression of a cellulase gene
A;Reference number: S59499; MUID:96145728; FMID:8590631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                  맑
                                                      Ş
                                                                                                   맑
                                                                                                                                        Ś
                                                                                                                                                                                   밁
                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                         맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C; Accession: S59499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cellulase egl1 - smut fungus (Ustilago maydis)
C;Species: Ustilago maydis (corn smut)
C;Date: 20-Jul-1996 #sequence_revision 13-Mar-1997 #text_change 28-May-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Accession: S59499
                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Cross-references: GB:S81598; NID:g1478378; PIDN:AAB36147.1; PID:g1478379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Residues: 1-393 <SCH>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Status: preliminary; not compared with
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Molecule type: mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
les 107; Conserv
                                                                                                                                                                                                                                                                                                                                                                                  тосят
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         297 SCSANNTRLSDVSVGSSCDGGGGYMCWDKIPFAVSPTLAYGYAAT----SSGDVCGRCY
                  189
                                                                                                   129
                                                                                                                                            125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               472
                                                        176 DQCDSFPAPIKEGCQWRF-DWFQNADNPTF--TFQQVQCPAEIVARSGCKRNDDSSEPVF 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    53
                                                                                                                                                                                        72
                                                                                                                                                                                                                                67
                                                                                                                                                                                                                                                                            12
                                                                                                                                                                                                                                                                                                                  11 LAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQRL----SDFNV
                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WFQNADNPTFTFQQVQCPAEIVARSGCKRN 224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            G---GLPGAQYGGISSR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ALTET-----SGPVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQF 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACDANFORLSDENVOSGCN3GSAYSCADQTEWAVNDNLAYGFAATSIAGGSESSWCCACY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RSSVASSSLSSATSSSASSVSSVPPIDGGCNGYATRYWDCCKPHCGWSANVPSLVSPLQ 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RSTPVLRTTLAAALPLVASAASG-----SGQSTRYWDCCKPSCAWPGKA-AVSQPVY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVSNAELGAQYGGFLAACKQQLGYNASLSQYKSCVLNRCDSVFGSRGLTQLQQGCTWFAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QLQFTGSSYNAPGDPGSAALAGKTMIVQATNIGYDVSGGQFDILVPGGGVGAFNACSAQW
                  TECSKLPKPLQEGCKWRFSEW---GDNPVLKGSPKRVKCPKSLIDRSGCQRKDDNTISPY 245
                                                                                                 AMKRNKLIFQVTNVGGDVQSQNFDFQIFGGGIGAFFKGCFAQWGVEASLWGDQYGGVKSA 188
                                                                                                                        TW-----VVQSTSTGGDLGSNQFDIAMPGGGVGIF-NGCSSQFG---GLPGAQYGGISSR 175
                                                                                                                                                                                        QSGCNGGNKFMCSCMQPFDDETDPTLAFGFGA--FTTGQESDTDCACFYAEF-EHDAQGK 128
                                                                                                                                                                                                                              QSGCNGGSAYSCADQTPW--AVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGK 124
                                                                                                                                                                                                                                                                         ISISISIVHIDGVRAGMATRYWDCCLASASWEGKAPVYAPVDACKADGVTLIDSKKDPSG 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               30.6%; Score 507; DB 2; 39.6%; Pred. No. 1.5e-28; tive 38; Mismatches 73
                                                                                                                                                                                                                                                                                                                                                             27.8%; Score 462; DB 2; 30.9%; Pred. No. 1.8e-25; tive 41; Mismatches 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   conceptual translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----DQCDSF----PAPLKPGCQWRFD 194
                                                                                                                                                                                                                                                                                                                                                                  100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 511;
                                                                                                                                                                                                                                                                                                                                                                                                         Length 393,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the dimorphic fungus Ustili
                                                                                                                                                                                                                                                                                                                                                                116;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GWGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         351
                                                                                                                                                                                                                                                                                                                                                                  12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         subspeci
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       hom
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Description: hydrolysis of 1,4-beta-D-glucosidic linkages in beta-D-glucans A;Pathway: cellulose degradation C;Superfamily: fungal cellulose-binding domain homology C;Keywords: glycosidase; hydrolase; polysaccharide degradation F;1-17/Domain: signal sequence #status predicted <SIG>F;18-242/Product: cellulase #status predicted <MAT>F;210-241/Domain: fungal cellulose-binding domain homology <FCB>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            á
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
닭
                             Q
                                                                               밁
                                                                                                                      8
                                                                                                                                                                     맑
                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                              Ø
                                                                                                                                                                                                                                                                                                                                         멂
                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Molecule type: DNA
A;Residues: 206-241 <SAW>
A;Cross_references: EMBL:Z33381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C; Function:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Introns: 23/3; 45/3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Gene: egl5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Status: nucleic acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Residues:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Genetics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           233
  171
                                                                                                                          171
                                                                                                                                                                                                                 118
                                                                                    128
                                                                                                                                                                     86
                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                     60
                                                                                                                                                                                                                                                                                                                                                Ļ
                                                                                                                                                                                                                                                                                                                                                                                         7
                                                                                                                                                                                                                                                                                                                                                                                                                                    78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             T---
  QQETD-P--TPVLGNDTGSTPPGSSPPATSSSPPSGGGQQT--LYGQCGGAGWTGPTTCQ
                                        NDDSSFPVFTPPSGGNGGTGTPTSTAPGSGQTSPGGGSGCTSQKWAQCGGIGFSGCTTCV 283
                                                                                                                                                                     APCSSCGTGGAAGQSIIVMVTNLCPNNGNAQWCPVV--GGTN----
                                                                                                                                                                                                                                                              ALFDTAGASWCGAG-
                                                                                                                                                                                                                                                                                                  RLSDFNVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFT-- 117
                                                                                                                                                                                                                                                                                                                                             MKATIVIGSLIVGAVSAYKATTTRYYDGQEGACGCGSSSGAFPWQLGIGNGVYTA-AGSQ
                                                                                                                                                                                                                                                                                                                                                                                      LRTTLAAALPLVASAASGSGQSTRYWD-----CCKPSCAMPGKAAVSQPVYACDANFQ 59
                                                                                                                          GISSRDQCDSEPAPIKPGCQWRFD-WFQN---ADNPTFTFQQVQCPAEIVARSG----CKR
                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                              ---SGPVAGKTMVVQSTSTGGDLGSNQEDIAMPGGGVGIFNGCSSQFGGLPGAQXG 170
```

13.3%;

Score 221; DB 2; Pred. No. 1.1e-08; 9; Mismatches 101

DB 2; 101;

Length 242

such

as

Indels

98;

Gaps

59

CGKCYQLISTGQ 85

-70

223

39;

GYSYHFDIMAQNEIFGDNVVVDFEPIACPGQAASDWGTCLCVG 170

```
C;Date: 15-Feb-1996 #sequence_revision 01-Mar-1996 #text_change 17-Nc;Ascossion: $60143; $49043  
R;Saloheimo, A.; Henrissat, B.; Hoffren, A.; Teleman, O.; Penttila, submitted to the EMBL Data Library, May 1994  
A;Description: A novel small endoglucanase gene egl5 from Trichodern A;Reference number: $60143  
A;Accession: $60143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cellulase (BC 3.2.1.4) V precursor - fungus (Trichoderma reesei)
N;Alternate rames: endo-1,4-beta-glucanase V
C;Species: Trichoderma reesei
                     A;Cross-references: EMBL:Z33381; NID:g485863; PID:g485864
R;Saloheimo, A.; Henrissat, B.; Hoffren, A.M.; Teleman, O.; Penttilae, M.
Mol. Microbiol. 13, 25, 1994
Mol. Microbiol. 18, 1994
A;Title: A novel, small endoglucanase gene, eg15, from Trichoderma reesei isolated
A;Reference number: S49043; MUID:95075308; PMID:7984103
A;Accession: S49043
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Variety: strain QM9414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 366 SNPGAAQGGQGG 377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           246 SGKVDSANTAAPAQYKRDRSVCLAGGKKGKSAAGGVDGSGDASGGADASGAGGAAEGSQG
                                                                                                                                                                                                                                      1-242 <SAL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SGCTSQKWAQCG 272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QPEGYGQPSGGNDQGSSNGDATTGAGSGSGSDSGSTANGSGSGAPTSGSDGSAVAPPSGG
HOC
Shown
                                                                                                                                                                                                                                                                                                                                                                           gene egl5 from Trichoderma reesei isolated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -GGTGTPTSTAPGSGQTSPGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17-Mar-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (strain QM9414)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                233
                                                                                                        á
```

```
A;Description: catalyzes the hydrolysis of 1,4-beta-D-glucosidic bonds in cellulose C;Superfamily: cellulose 1,4-beta-cellobiosidase 1; fungal cellulose-binding domain C;Keywords: glycosidase; hydrolase; polysaccharide degradation F;1-17/Domain: signal sequence #status predicted <SIG>F;18-513/Product: cellulose 1,4-beta-cellobiosidase I #status predicted <MAT>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bio/Technology 1, 691-696, 1983
A;Title: Molecular cloning of exo-cellobiohydrolase I derived from Trichoderma reesei
A;Reference number: A00902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
        C;Accession: S45380, T.H.; Huang, L. R;Wey, T.T.; Hseu, T.H.; Huang, L. Curr. Microbiol. 28, 31-39, 1994
A;Title: Molecular cloning and sequence analysis of the cellobiohydrolase I gene A;Reference number: S45380; MUID:94100788; PMID:7764306
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             돲
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Introns: 154/2; 386/3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Molecule type: DNA
A; Residues: 1-513 < SHO>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cellulose 1,4-beta-cellobiosidase (BC 3.2.1.91) I precursor - fungus (Trichoderma reesei N_iAlternate names: exo-cellobiohydrolase I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    문
                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                            봆
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C:Function:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Gene: CBH1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Experimental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Accession: A00902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          R;Shoemaker, S.; Schweickart, V.; Ladner, M.; Gelfand, D.; Kwok, S.; Myambo,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C;Accession: A00902
                                                                                                 C;Species: Trichoderma koningii
C;Date: 20-Oct-1994 #sequence_r
                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                         댒
                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                         뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    F;482-513/Domain:
A;Reference number:
A;Accession: S45380
                                                                                                                                                      $45380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Comment: This is the most
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                   Date: 20-Oct-1994 #sequence_revision 10-Nov-1995 #text_change 22-Jun-1999
                                                                                                                                  llulose 1,4-beta-cellobiosidase (EC 3.2.1.91) -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local
                                                                                                                                                                                                                                                                                                                                                                                                                            304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   284
                                                                                                                                                                                                                       476
                                                                                                                                                                                                                                                                                         419
                                                                                                                                                                                                                                                                                                                           226
                                                                                                                                                                                                                                                                                                                                                          363
                                                                                                                                                                                                                                                                                                                                                                                          169
                                                                                                                                                                                                                                                                                                                                                                                                                                                              123
                                                                                                                                                                                                                                                       262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               74 SAYS-----C----ADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVA 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                91;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTYSDNRYGGTCLPDGCDWNPYRLGNTSFYG-----PGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APGTCKVQNQWYSQCL 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SGTTCOKLNDYYSOCL
                                                                                                                                                                                                                      GPTQSHYGQCGGTGYSGPTVCASGTTCQWLNPYYSQCL
                                                                                                                                                                                                                                                      GCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL
                                                                                                                                                                                                                                                                                         GVPAQVESQSPNAKVTFSNIKFGPIGSTGNPSGGNPPSGNRGTTTTRRPA---TTTGSSP
                                                                                                                                                                                                                                                                                                                                                            KGGLTQFKKATSGGMVLVMSL-WD-DYYANMLWLDSTYPTNETSSTPGAV--RGSCSTSS
                                                                                                                                                                                                                                                                                                                                                                                          YGGISSRDQCDSFPAPLKPGCQKRFDWFQN---ADNPTFTFQQVQCPAEIVARSGCKRND
                                                                                                                                                                                                                                                                                                                                                                                                                            -KLTVVTQFETSGAINRYYVQNGVTFQQPNAELGSYSGNELNDDYCTAEEAEFGGSSESD
                                                                                                                                                                                                                                                                                                                                                                                                                                                              GKTMVVQSTSTGGDLG----SNQFDIAMPGGGVGIFNG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PSSNNANTGIG----GHGSCCSEMDIWEAN-SISEALTPHPCTTVGQEICE---GDGC--G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPV--YACDANFQRLSDFNVQSGCNGG
                                                                                                                                                                                                                                                                                                                           -----DSSFP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          source:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    fungal cellulose-binding domain homology <FCB>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          strain L27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          abundantly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 219.5;
Pred. No. 2.7
                                                                                                                                                                                                                                                                                                                         VFTP----PSGGN---GGTGTFTSTAPGSGQTSPGGGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        produced cellulase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2.7e-08
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  122;
                                                                                                                                      fungus (Trichoderma koningii)
                                                                                                                                                                                                                         513
                                                                                                                                                                                                                                                           299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 513;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                               -CS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          this filamentous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -FTLDTTK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    89,
                                                                                                                                                                                                                                                                                                                                                                                                                                                              SQFGGLPGAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                            261
                                                                                                                                                                                                                                                                                             475
                                                                                                                                                                                                                                                                                                                                                            418
                                                                                                                                                                                                                                                                                                                                                                                              225
                                                                                                                                                                                                                                                                                                                                                                                                                               362
                                                                                                                                                                                                                                                                                                                                                                                                                                                               168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             <u>۳</u>.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          fungus;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Innis,
                                     from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           님
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Introns: 154/2; 386/3
                                                                                                                                                                                                                                                                                                                                                                                                                                                              C;Accession: S11439
R;Cheng, C.; Tsukagoshi, N.;
Nucleic Acids Res. 18, 5559,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        믕
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       뭉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C; Genetics:
                                                   밁
                                                                                   8
                                                                                                                        밁
                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                              A; Accession: S11439
                   Ś
                                                                                                                                                                                                                                                             F;482-513/Domain: fungal
                                                                                                                                                                                                                                                                                                            A; Introns: 154/2; 386/3
                                                                                                                                                                                                                                                                                                                                                            A;Molecule type: DNA
A;Residues: 1-513 <CHE>
                                                                                                                                                                                                                                                                                                                                                                                              A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                         Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                            Genetics:
                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       262
       128 WQSTSTGGDLG----SNQFDIAMPGGGVGIFNGCS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  91;
                                                                                                                                                                                           86,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -513 <WEY>
                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----DSSFP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                           Conservative
```

```
C;Superfamily: cellulose 1,4-beta-cellobiosidase I; fungal cellulose-binding domain C;Keywords: glycosidase; hydrolase; polysaccharide degradation F;482-513/Domain: fungal cellulose-binding domain homology <FCB>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Molecule type: DNA
A; Residues: 1-513 < WI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 7
S11439
Cellulose 1,4-beta-cellobiosidase (EC 3.2.1.91) - fungus (Trichoderma viride)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Title: Nucleotide sequence of the cellobiohydrolase gene A; Reference number: S11439; MUID:91016856; PMID:2216737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C;Species: Trichoderma viride
C;Date: 21-Nov-1993 #sequence_revision 10-Nov-1995 #text_change 22-Jun-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Cross-references: EMBL:X69976; NID:g457422; PIDN:CAA49596.1; PID:g457423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Cross-references: EMBL:X53931; NID:g5196; PIDN:CAA37878.1; PID:g295937
                                                                                                                                                                                                                                                                                                                                                    Superfamily: cellulose 1,4-beta-cellobiosidase I; fungal cellulose-binding domain; Keywords: glycosidase; hydrolase; polysaccharide degradation; 482-513/Domain: fungal cellulose-binding domain bomology <FCB>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     304 -KLTVVTQFETSGAINRYYVQNGVT=QQPNAELGSYSGNELNDDYCTAEEAEFGGSSFSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           262 GTYSDNRYGGTCDPDGCDWNPYRLGNTSFYG-----PGSS----FTLDTTK----
                                                                                                                                                   211 PSSNNANTGIG---GHGSCCSEMDIWEAN-SISEALTPHPCTTVGQEICEGDSCGGTYSG
                                                267 DRYGGTCDPDGCDWNPYRLGNTSFYG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           16 PLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPV--YACDANFQRLSDFNVQSGCNGG
                                                                                                                                                                                                16 PLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPV--YACDANPQRLSDFNVQSGCNGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SAYS-----C----ADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVA 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PSSNNANTGIG---GHGSCCSEMDIWEAN-SISEALTPHPCTTVGQEICE---GDGC--G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KGGLTQFKKATSGGMVLVMSL-WD-DYYANMLWLDSTYPTNETSSTPGAV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YGGISSRDQCDSFPAPLKPGCQWRFDWFQN---ADNPTFTFQQVQCPABIVARSGCKRND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKTMVVQSTSTGGDLG----SNQFDIAMPGGGVGIFNG-----CS---SQFGGLPGAQ 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCTSQKWAQCGGIGESGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVPAQVESQSPNAKVTFSNIKEGPIGSTGNPSGGNPFGGNRGTTTTRRPA---
                                                                                             SAY--SC----ADQTPWAVNDNLAYGEAATSIAGGSESSWCCACYALIFTSGPVAGKTMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPTQSHYGQCGGIGYSGPTVCASGTTCQVLNPYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N.; Udaka,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            13.2%;
                                                                                                                                                                                                                                                                              13.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    36;
                                                                                                                                                                                                                                                      36,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -VFTP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 219.5; DB :
Pred. No. 2.7e-08
                                                                                                                                                                                                                                                                              Score 215.5; DB 2
Pred. No. 5.2e-08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                           Mismatches
                                                     ---PGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PSGGN---GGTGTPTSTAPGSGQTSPGGGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 2;
                                                                                                                                                                                                                                                                                                         DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122;
                                                                                                                                                                                                                                                           137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 513;
                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                           Indels
                                                     FTLDTTK-----KLTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                from Trichoderma viride.
SQFGGLPGAQYGGIS 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    89;
                                                                                                                                                                                                                                                           69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -RGSCSTSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -TTTGSSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      73
                                                        307
                                                                                                        127
                                                                                                                                                           266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                303
                                                                                                                                                                                                              73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22
                                                                                                                                                                                                                                                              16
                                                                                                                                                                                                                                                                                                                                                                                                                    Ă.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ă
```

- 317 - 211	-GDTVDTSKTFTIITQFWTDNGSPSGNLVSITRKYQG FGGLPGAQYGGISSRDQCDSFPAPLKPGCQWRFD-WF	, 8 B
GPV-GPV	96 ATSIAGGSESSWCC	원 원 원
H H	67 QBGCNGGSAYSCADQTPWAVNDNLAYGFA 155 DLSALPCGENGSLYLSQMDENGGANQYNTAGANYGSGY-CDAQCPVQTWR-NGTL	망생
33	19 ASAASGSGQSTRYWDCCKDSCAWPGKAAVSQDVYACDANFQRLSDENV	Ag Ag
, m	Query Match 12.9%; Score 214; DB 2; Length 459; Best Local Similarity 27.0%; Pred. No. 6e-08; Matches 108; Conservative 31; Mismatches 101; Indels 160; Gaps	Query Best 1 Match
E. F	A;Introns: 257/2; 454/1 C;Function: A;Description: hydrolysis of 1,4-beta-D-glucosidic linkages in beta-D-glucans A;Pathway: cellulose degradation C;Superfamily: cellulose 1,4-beta-cellobiosidase I; fungal cellulose-binding: C;Keywords: glycosidase; hydrolase; polysaccharide degradation E;1-22/Domain: signal sequence #status predicted <sig> F;23-459/Product: cellulase A #status predicted <mat> F;428-459/Domain: fungal cellulose-binding domain homology <fcb></fcb></mat></sig>	A; Int C; Fun A; Des A; Pat C; Sup C; Xey F; 1-23 F; 23-
7	A; Molecule type: mRNA A;Residues: 1-459 <pen> A;Cross-references: GB:M15665; NID:g170546; PIDN:AAA34212.1; PID:g17054 C;Genetics: A;Gene: eq11</pen>	A; Mol A; Res A; Crc C; Gen A; Gen
te s,	.; Lehtovaara, I 63, 1986 ogy between cell nber: A25565; M	R; Pen Gene A; Tit A; Ref
	A; Charlus: not compared with conceptual translation A; Molecule type: DNA A; Residues: 1-459 < VAN> A; Residues: 1-459 < VAN> A. Froerimental source: strain 1.27	A;Sta A;Mol A;Res
, D.H.; evisiae	R. Van Arsdell, J.N.; Kwok, S.; Schweickart, V.L.; Ladner, M.B.; Gelfand, D.H.; Bio/Technology 5, 60-64, 1987 A;Title: Cloning, characterization, and expression in Saccharomyces cerevisiae A;Reference number: A25928 A. Accession: 25828	R;Van Bio/T Bio/T A;Tit A;Ref
(9	8 SECTION ASSOCIATION OF THE PROPERTY OF THE	RESULT A25928 cellula cellula N;Alte C;Speci
	272 GGIGFSGCTTCVSGTTCQKLNDYYSQCL 299 :	B 6
$\aleph = \aleph$	227 SSFPVFTPPSGGNGGTGTPTSTAPGSGGTSGGGSGCTSQKWAQC	용 정
E E	174 SRDCCDSFPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDD	B &
- 53	308 VTQFETSGAINRYYVQNGVTFQQPNAELGDYSGNSLDDDYCAAEEAEFGGSSFSDKGGLT	Ъ

```
;ellulose 1,4-beta-cellobiosidase (EC 3.2.1.91) - basidiomycete (Phanerochaete chryso
;>Species: Phanerochaete chrysosporium
;>Date: 22-Nov-1993 #sequence_revision 10-Nov-1995 #text_change 22-Jun-1999
;>Accession: S33164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ;Description: hydrolysis of 1,4-beta-D-glucosidic linkages in beta-D-glucans such as ;Pathway; cellulose degradation ;Superfamily: cellulose 1,4-beta-cellobiosidase I; fungal cellulose-binding domain h;Keywords: extracellular protein; glycosidase; hydrolase; polysaccharide degradation;432-463/Domain: fungal cellulose-binding domain homology <FCB>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GOnzalez, R.; Ramon, D.; Perez-Gonzalez, J.A.
ppl. Microbiol. Biotechnol. 38, 370-375, 1992
Fittle: Cloning, sequence analysis and yeast expression of the egl1 gene from Trichc; Reference number. A48375; MUID:93159747; PMID:1369161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Alternate names: endo-1,4-beta-glucanase; endoglucanase I homolog EGL1; Species: Trichoderma longibrachiatum
; Species: 19-Nov-1993 #sequence_revision 18-Nov-1994 #text_change 22-Jun-1; Accession: A43375; S28521
; Gonzalez, R.; Ramon, D.; Perez-Gonzalez, J.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Cross-references: EMBL:X60652; NID:g5181; PIDN:CAA43059.1; PID:g5182
Note: sequence extracted from NCBI backbone (NCBIN:125157, NCBIP:125158)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Molecule type: DNA
Residues: 1-463 <GON>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Contents: CECT 2606
Accession: A48375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         llulase (EC 3.2.1.4) - fungus (Trichoderma longibrachiatum)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Function:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Introns: 257/2; 458/1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               260 GSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        367 PSNILA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             212 PAEIVARSGCKRNDDSSFPVFTPPSGGNGGTGTFTSTA----PGSGQT------SPGG 259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       318 ----ASAYGGLATMGKA-----LSSGMVLVFSIMNDNSQYMNWLDSGNAGPCSSTEGN 366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420 SPSCTQTHWGQCGGIGYSGCKTCTSGTTCQYSNDYYSQCL 459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   144 I--AMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDSFPAPLKPGCQWRFD-WFQNAD 200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           242 DSAGCGENPYGSGYPNYFGPGDTVDTSKTFTIITQFNTDNGSPSGNLVSITRKYRQNGVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             184 AGANYGSGY-CDAQCFVQTWR-NGTLNTSGQGFCCNEMDILEGNSRANALTPHSCTATAC 241
                                                                                                                                                                                                                                         461
                                                                                                                                                                                                                                                                                              297 QCL 299
                                                                                                                                                                                                                                                                                                                                                              403
                                                                                                                                                                                                                                                                                                                                                                                                         240 ---GGTGTPTSTAPGSGQTSPGGGSGCTSQXWAQCGGIGFSGCTTCVSGTTCQKLMDYYS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          348 YMWWLDSGRAGECSSTEGNESNIL--ANNEGTHVVYSNIRWGDIGS---TTNSTGGNEEP 402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120 PVAG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                     PPPPASSTIPSTIRRSSTIS--SSPSCIQTHWCQCGGIGYTGCKTCISGTICQYGNDYYS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IPSAKPGGDT--ISSCPS----ASAYGGLATMGKA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SGCNGGSAYSCADQTP---WAVNDNL---AYGFAAT--SIAGGSESSWCCACYALTETSG 119
                                                                                                                                                                                                                                         QCL 463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --NNPNTHVVFSNIRWGDIGS-TINSTAPPPPPASSTTFSTTRRSSTTSS 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -NPTFTFQQVQCPABIVARSGCKRNDDSSFPVFTPPSGGN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 203; DB 2;
Pred. No. 3.6e-07;
2; Mismatches 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -KIMVV-----QSTSTGGDLGS-----NQFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   #text_change 22-Jun-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ---LSSGMVLVPSIWNDNSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                        460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 143
```

```
닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: EMBL:Z22528; NID:g296026; PIDN:CAA80253.1; PID:g296027 C;Superfamily: cellulose 1,4-beta-cellobiosidase 1; fungal cellulose-binding C;Reywords: glycosidase; hydrolase; polysaccharide degradation C;Reywords: glycosidase; hydrolase; polysaccharide degradation F;485-516/Domain: fungal cellulose-binding domain homology <PCB>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Reference number: S33164
A;Accession: S33164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R;Sims, P.F.G.; Soares-Felipe, S.M.; Gent, M.E.; Tempelaars, C.; Wang, Q.; Broda, P. submitted to the EMBL Data Library, April 1993
A;Description: Differential expression of multiple exo-cellobiohydrolase I-like genes
                                                                                                                                                                                         A; Experimental C; Comment: This
                                                                                                                                                                                                                                                                                                                                                                                                                                               뮍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          돲
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     맒
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Molecule type: DNA
A; Residues: 1-516 <SIM>
                                                                                                  A;Introns: 257/2; 459/1
C;Superfamily: cellulose 1,4-beta-cellobiosidase I; fungal cellu
C;Superfamily: glycoprotein
C;Keywords: glycoprotein
F;433-464/Domain: fungal cellulose-binding domain homology <FCB>
                                                                                                                                                                                                                                                                R;Kwon, I.; Ekino, K.; Gotc, M.; Furukawa, K.
Biosci. Biotechnol. Biochem. 63, 1714-1720, 1999
A;Title: Heterologous expression and characterization of
A;Reference number: CC7143; MUID:20052947; PMID:10586500
                                                                                                                                                                                                                                                                                                                                                       endoglucanase I - fungus (Trichoderma viride)
C;Species: Trichoderma viride
             Ş
                                                                                                                                                            A;Gene: egl1
                                                                                                                                                                                                                      A; Residues:
                                                                                                                                                                                                                                                    A; Accession: JC7143
                                                                                                                                                                                                                                                                                                                         C; Accession:
                                                                                                                                                                                                                                 A; Molecule type:
                                                                                                                                                                                          ;Comment: This protein is a
                                                                                                                                                                                                                                                                                                                                       ;Date: 04-Mar-2000 #sequence_revision 04-Mar-2000 #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             74
                21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  88;
                                                                                                                                                                                                                        1-464 < KMC>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                            Similarity
                                                                                                                                                                                                                                                                                                                            JC7143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SAASSSGOSTRYWDCCKPSCAWPGK---AAVSQPVYACDANFQRLSDFNVQSGCNGG----
                                                                                                                                                                                                                                                                                                                                                                                                                                               O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ESSWCCACYALTETSGPVAGKTMVVQSTST----GGDLGSNQFDIAMPGGGVGIFNGCSSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DEGLCDADGCDENSFRMGDQTFLGKGLTVDTSKPFTVVTQFITNDGTSMG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SANAGIG---NYGICCIEMDIWEANNDAAAYIP-HPCII-----NAQIRCSGSDCIR 258
AASG---SGQS---TRYWDCCKPSCAWPGKAAVSQPVYACDA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SSSHSSTSTSSSHSSSSTEPTQPTGVTVPQWGQCGGIGYTGSTTCASPYTCHVLNPYYSQ 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DPSTPGVARGTCATTSGVPAQIEAQS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMPTETFQQVQC-----PABIVARSGCKRNDDSSFPVFTPPSGGNGGT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KTAFGDTNYFAQHGGLKQVGEALRTGMVLALSIWDDYAANML-
                                                                                                                                                                                                          source:
                                                                                                                                                                                                                                                                                                                                                                                                                                               515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            298
                                                                                                                                                                                                                                      mRNA.
                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FGGLP-GAQYGGISSRDQC----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ----TLTEIRRLYVQNGKVIQNSSVKIPGIDLVNSITD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -GTPTSTAPGSGQTSPGGGSGCTSQKWAQCGGIGESGCTTCVSGTTCQKLNDYYSQ
                                                                                                                                                                                                          HX-75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --SAYSCADQT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11.5%;
24.4%;
                                                         11.48;
                                                                                                                                                                                         fusion glycoprotein with catalytic
                                            32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 190; DB Pred. No. 3.3e 34; Mismatches
                                            Score 189; DB:
Pred. No. 3.5e-1
32; Mismatches :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----PNAYVVFSNIKFGDLNTIYTGTVSSSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ); DB 2;
3.3e-06;
                                                          DB 2;
1.5e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PWAY-----NDNLAYGEAATSIAGGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DSFPAPLKPGCQWRFDWFQ----
                                            108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     101;
                                                                                                                                   I; furgal cellulose-binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 516;
                                                                       Length 464;
                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                 endoglucanase
                ----NFQRLSDEN
                                              160;
                                                                                                                                                                                            ard
                                                                                                                                                                                                                                                                                                                                            31-Mar-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WLDSNYPTNK 400
                                                                                                                                                                                            cellulose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NA 199
                                                                                                                                                                                                                                                                                   (EGI)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             103
                  65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            domain home
                                                                                                                                    domain
                                                                                                                                                                                          binding
                                                                                                                                                                                                                                                                                   from
                                                                                                                                    рď
                                                                                                                                                                                                                                                                                    Tri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     맔
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   맒
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뮍
                                                                                                                                                                                              믕
                                                                                                                                                                                                                      Ś
                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Molecule type: mRNA
A; Residues: 1-302 < MAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  R; Margolles-Clark,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       멂
                                         5
                                                                           맑
                                                                                                  Ś
                                                                                                                                   밁
                                                                                                                                                            S
                                                                                                                                                                                                                                                     믕
                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Gene: axel
                                                                                                                                                                                                                                                                                                                                                                                                                                                     C;Genetics:
                    몽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Accession: S71334
                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   258
                    269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99
                                                                                                                                                                                                                                                                                                                 73;
                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                      GLPYNVG
```

```
C;Date: 23-Jul-1997 #sequence_revision 01-Aug-1997 #text_change 17-Mar-1999 C;Accession: S71334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acetyl xylan esterase precursor - fungus (Trichoderma reesei)
C;Species: Trichoderma reesei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C;Superfamily: fungal cellulose-binding domain homology F;1-20/Domain: signal sequence #status predicted <SIG> F;21-302/Product: acetyl xylan esterase #status predicted <MAT> F;271-302/Domain: fungal cellulose-binding domain homology <FCB>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Eur. J. Biochem. 237, 553-560, 1996
A;Title: Acetyl xylan esterase from Trichoderma reesei
A;Reference number: $71334; MUID:96235218; PMID:8647098
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Cross-references: EMBL:Z69256; NID:g1431619; PID:e220701; PID:g1431620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           154 VDLSALPCGENGSLYLSEMDETGGANQYNTAGANYGSGY-CDAQCPVQTWR-NGTLNTSH 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                100 AASGVQTSGASLTMNQY----MPSSS-GGYSSVSPRLYLLDSDGBYVLLKLNGQELS-FD
                                                                                            216 NVHQGYGQEYGQQALAFINSQLSSGGSQPPGGGPTSTSRPTSTRTGS-
                                                                                                                                                                                                                                                                                                  110 CPDTQLVLVGYSQGAQIFDNALCGGGDPGEGITNTAVPLTAGAVSAVKAAIFMGDPRNIH 169
                                                                                                                                                                                                                                                                                                                                                  128 ---VQSTSTGGDLGSNQFDIAMPGG---GVGIFNGCSSQFGGLPGAQYGGISSRDQCDSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                         92 YGFAATSI-----
THWGQCGGQGWTGPTQCESGTTCQVISQWYSQCL
                                       QKWAQCGGIGFSGCTTCVSGTTCQKLMDYYSQCL
                                                                                                                                                                                                                                                   PAPLKPGCQWREDWFQNADNPTFTFQQVQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGGSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AEIVARS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LTTMGKA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ISSRDQCDSFPAPLKPGCQWRFD-WFQNAD---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TIITQENTDDGSATGNLVSITRKYRQNGVDIPSAKPGGDT--ISSCES-----ASAYGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QGFCCNEMDILEGNSRANALTPHSCTATACDSAGCGFNPYGSGYPNYYGPGDTVDTSKVF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YGFAAT--SIAGGSESSWCCACYALTFISGPVAG
                                                                                                                                                                                                                                                                                                                                                                                                       YGSSATVVNLVIQAHPGTTSEAIVYPACGGQASCGGISYANSVVNGTNAAAAAINNFHNS 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -SSPSCTQTHYGQCNGIGYTGCKTCAAGTTCQYSNDYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -NILANNPNTHVVFSNIRWGDIGSTTNSTGTTP---PPPPPPPPASSTTLSTTRRSSTTS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TMVVQ-STSTGGDLGS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  E.; Tenkanen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11.4%;
26.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LSSGMVLVFSIWNDNSQYMNWLDSGSAGPCSSTEGNPT------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17; Mismatches
                                                                                                                                                   NDDSSFPVFTPPSGGNGGTGTPTSTAPGSGQTSPGGGSGCTS 265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       M.; Soederlund,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 188.5;
                                                                                                                                                                                                      TCTTQGFDARPAGFVCPSASKIKSYCDAADPYCCTGNDP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GCKRNDDSSFPVFTPPSGGNGGTGTPTSTAPGSGQTSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -NOFDI--AMPGGGVGIFNGCSSQFGGLPGAQYGG 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                         -AGGSESSWCCACYALTETSGPVAGKTMV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2.5e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SGCNGGSAYSCADQTP---WAVNDNL---A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       H.; Penttilae,
       302
                                                    299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97;
                                                                                                                                                                                                                                                     -CPAEIVARSGCKR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 302;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       contains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NPTFTFQQVQCP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          active-site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -- K 124
                                                                                                            ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ٩
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            423
                                                                                                            268
                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  323
                                                                                                                                                                                                                                                             223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          serine
```

```
cellulose 1,4-beta-cellobiosidase (EC 3.2.1.91) - imperfect fungus (Humicola grisea) N;Alternate names: beta-glucancellobiohydrolase; exoglucanase C;Species: Humicola grisea var. thermoidea C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999 C;Accession: S38794; S08240; A45869 R;Radford, A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Molecule type: DNA
A;Residues: 1-20,'R',22-34,'K',36-86,'H',88-141,'V',143-157,'Y',159-237,'QQH',241-244,'A;Residues: 1-20,'R',22-34,'K',36-86,'H',88-141,'V',143-157,'Y',159-237,'QQH',241-244,'A;Ross-references: GB:M6458B; GB:X17258
A;Cross-references: GB:M6458B; GB:X17258
A:Note: this sequence has been revised. See entry S08240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Residues: 1-299,'H',301-525 <DEO>
A;Cross-references: EMBL:X17258
A;Cross-references: EMBL:X17258
A;Note: the authors translated the codon CAG for residue 87 as His A;Note: this sequence has been revised in reference S38794
A;Note: this sequence has been revised in reference S38794
A;Acter this sequence Has been revised in reference S38794
A;Acter this sequence As569-2576, 1930
J. Gen. Microbiol. 136, 2569-2576, 1930
A;Title: Cloning, sequencing and homologies of the cbh-1 (exoglucar A;Reference number: A45869; MUID:91178527; PMID:2127803
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C;Superfamily: cellulose 1,4-beta-cellobiosidase I; fungal cellulose-binding domain home C;Keywords: glycosidase; hydrolase; polysaccharide degradation F;494-525/Domain: fungal cellulose-binding domain homology <FCB>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  R;de Cliviera Azevedo, M.; Radford, A.

Ride Cliviera Res. 18, 668, 1990
A;Title: Sequence of cbh-1 gene of Humicola grisea var.
A;Reference number: S08240; MUID:90175006; PMID:2308855
                         Ś
                                                                                    문
                                                                                                                                         Š
                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                            맒
                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Introns: 138/1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Gene: cbb-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Status: not compared with conceptual translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Accession: A45869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Accession:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Cross-references: EMBL:X17258; NID:g2760; PIDN:CAA35159.1; PID:g2761
A;Note: this is a revision to the sequence from reference S08240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Residues: 1-525 < RAD>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Accession: S38794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Reference number:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         submitted to the EMBL Data Library, June 1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Genetics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
nes 97; Conser
                               270
                                                                                                                                                                                                              386
                                                                                                                                                                                                                                                                                                                               326
                                                                                                                                                                                                                                                                                                                                                                                           143
                                                                                                                                                                                                                                                                                                                                                                                                                                                   266 YSNERYAGVCDPDGCDFNSYRQGNKTFYGKGMTVDTTKKITVVTQFLKDANGDLGEIKRF 325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       207 NIEGWTGSTNDPNAGAGRYGTCCSEMDIWEAN-NMATAFTPHPCTIIGQSRCEGDSCGGT 265
                                                                                          436 SNVVFSNIRFGPIGSTVAGLPGAGNGGNNGGNPPPPTTTTSSAPATTTTASAGPKAGRWQ 495
                                                                                                                                                                                                                                                                    186 KPGCQWRFDWFQNADNPTF---TFQQVQCPAEIVARSGCKRN---DDSSFPV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              159 LNGALYFVSMDADGG--LSRY--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               65 NVQSGCN-----GGSAYS--CADQTPWAVNDNLAYGFA--ATSIAGGS--ESSWCCAC 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11 LAAALELVASAASGSGQSTRYWDCCKPSCAWPG-KAAVSQPVYACDANFQRLSDF----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S08240
OCGGIGFSGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                               YVQDGKIIPNSESTIPGVEGNSITQDWCDRQKVAFGDIDDFNRKGGMKQMGKALAGPMVL 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S38794
                                                                                                                                                                                                                                                                                                                                                                                    ---DIAMPG--GGVGIFNGCSSQ---FGGLPG-AQYGGISSRDQCDSFPAPL 185
                                                                                                                                                                                                              -WDDHASNMLWLDSTF-----PVDAAGKPGAERGACPTTSGVPAEVEAEAPN 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              11.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  33,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 185; DB 1;
Pred. No. 7.5e-06;
                                                                                                                                                   PSGGNGGTG----TPTSTAPGSGQTSPGGGSGCTSQKWA 269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---PWAGKTMVVQST----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              - PGNKAGAKYGTGYCDAQCPRDIKFINGEA 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 525;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels 124;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     thermoidea.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (exoglucanase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----STGGDLGS-NQF 142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene of Humicol
                                                                                                                                                                                                                                                                          231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23
```

```
G;Superfamily: cellulose 1,4-beta-cellobiosidase I; fungal cell
C;Keywords: 9lycosidase; hydrolase; polysaccharide degradation
F;485-516/Domain: £ungal cellulose-binding domain homology <FCT
F;81,92/Active site: Asp #status predicted
                                                                                                                                                                                                                                                                          문
                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               맑
                                      Ŕ
                                                                                        밁
                                                                                                                                 ঠ
                                                                                                                                                                               문
                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                문
                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Experimental source: s
C; Comment: This protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gene 74, 411-422, 1988
A; Title: The identification,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C;Species: Phanerochaete chrysosporium
C;Date: 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change 04-Sep-1998
맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Introns: 201/3; 511/1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Residues:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Accession: JS0083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Title: The identification, molecular cloning and characterisation of a gene A;Reference number: JS0083; MUID:89232732; PMID:3246351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   R;Sims, P.; James, C.; Broda, P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C;Accession: JS0083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cellulose 1,4-beta-cellobiosidase (EC 3.2.1.91) I - basidiomycete (Phanerochaete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                    362
                                                                                                                                                                                                                               170
                                                                                                                                                                                                                                                                            307
                                                                                                                                                                                                                                                                                                                        122 AG-----KTMVVQSTSTGGDLGSNQFDIAMPG-GGVGIF--NGCSSQ---FGGLP-GAQY 169
  468
                                                                                           414 TISGVPAQIEAQS
                                                                                                                                      212
                                                                                                                                                                                                                                                                                                                                                                     259 DTGLCDADGCDFNSFRMGDQT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                              211 SANAGTG---NYGTCCTEMDIWEANNDAAAYTP-HPCTT-----NAQTRCSGSDCTR 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  496 QCGGIGFTGPTQCEEPYICTKLNDWYSQCL 525
                                      251 GSGQTSPGGGSGCTSQXWAQCGGIGFSGCTTCVSGTTCQXLADYYSQC 298
                                                                                                                                                                                                                                                                                                                                                                                                                   74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20 SAASGSGQSTRYWDCCKPSCAWPGK--AAVSQPVYACDANFQRLSDFNVQSGCNGG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         86;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1-516 <SIM>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
  SSSSTPPTQPTGVTVPQWGQCGGIGYTGSTTCASPYTCHVLNPYYSQC
                                                                                                                                        ----PAEIVARSGCKRNDDSSFPVFTPPSGGNGGT---
                                                                                                                                                                                 GGLKQVGEALRTGMVLALSIWDDYAANML-----WLDSNYPTNKDPSTPGVARGTCA 413
                                                                                                                                                                                                                                 GGISSRDQC----
                                                                                                                                                                                                                                                                        AGTLTEIRRLYVQN----GKVIQNS-SVKIPGIDPVNSITDNFCSQQKTAFGDTNYFAQH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cellulose 1,4-beta-cellobiosidase I; fungal cellulose-binding domain h
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 strain ME446
1 is a component of the inducible cellulase complex.
                                                                                                                                                                                                                                                                                                                                                                                                                -SAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPV 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         11.1%; Score 184; DB 2; 1
24.7%; Pred. No. 8.7e-06;
tive 37; Mismatches 113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       37;
                                                                                             PNAYVVESNIKEGDLNTTYTGTVSSSSVSSSHSSTSTSSSH
                                                                                                                                                                                                                               -DSFPAPLKPGCQWRFDWFQ-----NADNPTFTFQQVQC-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     domain homology <FCB>
                                                                                                                                                                                                                                                                                                                                                                        FLGKGLTVDTSKPFTVVTQFIT-NDGTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 112;
                                                                                                                                             ----GTPTSTAP 250
       515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                  46.
                                                                                                                                                                                                                                    211
                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        chry
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P
```

Η.

Penicillium janthinellum

Gene 124, 57-65, 1993
A;Title: Cloning, sequencing, and beterologous expression
A;Reference number: JU0150; MUID:93178976; PMID:8440481 C;Accession: JU0150; S21508
R;Christoph, A.K.; Weigel, T.O.; Schulz,
Gene 124, 57-65, 1993 cellulose 1,4-beta-cellobiosidase (EC 3.2.1.91) I - N;Alternate names: exo-cellobiohydrolase C;Species: Penicillium janthinellum C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 A;Residues: A; Molecule type: mRNA A; Accession: JU0150 1-537 <CHR> #text_change of a cellulase-encoding cDN 16-Jun-2000

A;Gene: cbhl C;Superfamily: cellulose 1,4-beta-cellobiosidase

H

fungal cellulose-binding domain

PID:g3178

C; Genetics:

A;Cross-references: EMBL:X59054; NID:g3177; PIDN:CAA41780.1; A;Note: the authors translated the codon ATG for residue 172

C;Keywords: glycosidase; hydrolase; polysaccharide degradation F;506-537/Domain: fungal cellulose-binding domain homology <FCB>

500 GEGARDWAOCGGNGWTGPTTCVSPYTCTKONDWYSOCI 537
262 GCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL 299
442 NAYVIYSNIKTGPLNSTETGGTTSSSSTTTTTSKSTSTSSSSKTTTTVTTTTTSSGSS
213 AEIVARSGCKRNDDSSFPVFTPPSGGNGGTGTPTSTAPGSGQTSPGGGS
408 DSTYPTNATSTTPGAKRGTCDISRRPNTVESTY
158SQFGGLEGAQYGGISSRDQCDSFBAPLX2GCQWREDWFQNADNPTFTFQQVQCP 212
363QKSAFGD-TNEFSKHGGMAGMGAGLADGMVIVMSLMDDHASDMLWI. 407
117 TSGPVÄGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGC
309 FTVVTQFLTNDGTSTGTLSEIKRFYVQGGKVIGNPQSTIVGVSGNSITDSWCNA
84 WAVNDNLAYGFAATSIAGGS-ESSWCCACYALTF 116
268 GTYSTDRYGGTCDPDGCDFNPYRMGVTNFYGEGETIDTKSP 308
24 GSGQSTRYWDCCKESCAWPGKAAVSQPVYACDANFQRLSDENVQSGCNGGSAYSCADQTP
zative 3
BOST TOTAL STREET 23 44. Brod NO 1 10-05.

Search completed: July 7, 2004, 08:54:54 Job time : 23 secs

```
GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compugen Ltd.
```

OM protein protein search, using sw model

Run on: July 7, 2004, 08:46:50 ; Search time 17 Seconds (without alignments) 915.822 Million cell updates/sec

Title: Perfect score: 1659 US-10-007-521-12

Sequence: 1 MRSTPVLRTTLAAALPLVAS......

.TECVSGTTCQKLNDYYSQCL 299

Scoring table: BLOSUM62 Gapop 10.0 , Gapext 0.5

Searched: 141681 segs, 52070155 residues

Total number of hits satisfying chosen parameters:

141681

Minimum DB seq length: 0
Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

SwissProt_42:*

Pred. Mo. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

بن	32	31	30	29	28	27	25	ή 73	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	œ)	۵J	ر ت	4	ω	2	μ	Result No.
118.5	118.5	118.5	120	120.5	122	124	125.5	127	127	127	129	137	143.5	149.5	156	158.5	159	172	181	183	184	185	203	214	215.5	219.5	221	247	462	507	921.5	942.5	Score
7.1	7.1	7.5	7.2	7.3	·7	7.5	7.6	7.7	7.7	7.7	 8	æ.3	8.6	9.0	9.4	9.6	9.6	10.4	10.9				12.2	12.9	13.0	13.2	13.3	14.9	27.8	30.6		56.8	Query Match L
1387 1	453 1	210 1	5376 1	303 1	182 1	471 1	316 1	610 l	462 1	385 1	418 1	438 1	388 1	540 1	506 1	514 1	344 1	320 1	516 1	537 1	516 1	525 1	463 1	459 1	513 1	513 1	242 1	353 I	393 1	511 1	213 1	376 1	Length DB
TROP HUMAN	VG DROME	PSBP_PORPU	ZAN MOUSE	34KD MYCTU	KRUC_SHEEP	GUX2 TRIRE	LORI HUMAN	NU54 DROME	GUNB FUSOX	GUNF_FUSOX	GUN2_TRIRE	GUX3 AGABI	GUN3 HUMIN	GUX1 ASPAC	GUX2_AGABI	GUXC FUSOX	GUN4 TRIRE	CEL1 AGABI	GUX1_NEUCR	GUX1 PENJA	GUX1 PHACH	GUX1_HUMGT	GUN1 TRILC	GUN1 TRIRE	GUX1 TRIVI	GUX1 TRIRE	GUN5 TRIRE	FAEB PENFN	GUN1_USIMA	GUNB PSEFL	GUNS_HUMIN	GUNK FUSOX	ID
_					Ū				,	,	.,		_	•			••						•					_			_		
Q12816	Q26366	P50272	088799	P71556	P26372	P07987	P23490	Q9v6b9	P46236	P46239	P07982	P49075	4	059843	Q92400		014405	Q00023	P38676	Q06886	P13860	P15828	Q12714	P07981	P19355	P00725	7	Q9he18	P54424	P18126	P43316	P45699	Description
homo sapien	drosophila	porphyra pu	mus musculu	mycobacteri	ovis aries	trichoderma	homo sapien	drosophila	fusarium ox	fusarium ox	trichoderma	agaricus bi		aspergillus	agaricus bi		trichoderma	agaricus bi	neurospora	penicillium	phanerochae	humicola gr	trichoderma	trichoderma	trichoderma	trichoderma	trichoderma	penicillium	ustilago ma	pseudomonas	humicola in	fusarium ox	tion

113.5 6.8 2090 1 NZ14 HUMAN 110.5 6.7 675 1 YMVZ CAEEL 1109.5 6.6 575 8 1 FUS MOUSE 11.29 6.6 660 1 YHLI EBV 1.29 6.4 967 1 ATS1 RAT 1.67 6.4 967 1 ATS1 MOUSE 1105.5 6.4 2704 1 G168 PARPR 105.5 6.4 452 1 GUX1 CRYPA 1.05 6.3 481 1 LORI MOUSE 1.03 6.2 491 1 YK98 MYCTU 1.03 6.2 491 1 YK98 MYCTU 1.03 6.2 537 1 SP70_DICDI	6.8 2090 1 6.6 518 1 6.6 560 1 6.4 967 1 6.4 2704 1 6.4 452 1 6.3 481 1 6.2 394 1 6.2 491 1 6.2 491 1	45	44	43	42	41	40	39	38	37	36	3 5	34
2090 1 675 1 678 1 660 1 967 1 968 1 2704 1 452 1 452 1 452 1 452 1 451 1 394 1 491 1	2090 1 N214 HUMAN P3565 675 1 YMYZ CAEEL P3450- 518 1 FUS MOUSE P5695 518 1 FUS MOUSE P5695 660 1 YHLI EBV P318 967 1 ATS1 RAT P9785 2704 1 G168 PARPR P1705- 452 1 GUX1 CRYPA P1816- 452 1 GUX1 CRYPA P1816- 454 1 THYD CLAFS P1816- 371 1 SP70_ICDI P1526	103	103	103	105	105.5	106.5	107	107	109	109.5	110.5	113.5
	1 N214 HUMAN P3565 1 YNV CAREL P3450. 1 YNV CAREL P3450. 1 FUS MOUSE P5695 1 YHLI BBV 99318 1 ATSI RAT 99783. 1 ATSI RAT 99783. 1 ATSI MOUSE P1705. 1 TARI MOUSE P1705. 1 TARI MOUSE P1705. 1 TARI MOUSE P1705. 1 TARI MOUSE P1816. 1 TARI MOUSE P1816. 1 TARI MOUSE P1816. 1 TARI MOUSE P1816.	6.2	6.2	6.2	6.3	6.4	6.4	6.4	6.4	6.6	6.6	6.7	6.8
1 N214 HUMAN 1 YAV CAEEL 1 FUS MOUSE 1 YHLI EBV 1 ATSI RAT 1 ATSI MOUSE 1 G168 PARPR 1 GUX1 CRYPA 1 GUX1 CRYPA 1 GUX1 CRYPA 1 TAND CLAFS 1 YK98 MYCTU 1 SP70_DICDI	P3565 P3450 P56955 P6318 P0318 P1705 P1705 P1816 Q1070 Q1070	537	491	394	481	452	2704	968	967	660	518	675	2090
NZ14 HUMAN YMYZ CAEEL FUS MOUSE YHLI BBV ATS1 MOUSE ATS1 MOUSE G168 PARPR GUX1 CRYPA LORK MOUSE THYD CLAFS YKSB MYCTU SP70_DICDI	P3565 P3450 P56955 P6318 P0318 P1705 P1705 P1816 Q1070 Q1070	H	\vdash	μ	Н	μ.	н	H	۳	ب	۳	μ	Н
	P35658 P34504 P56959 P03181 Q9wuq1 P97857 P17053 P18165 Q9uvi4 Q10707 P15269	SP70_DICDI	YK98_MYCTU	THYD_CLAFS	LORI_MOUSE	GUX1_CRYPA	G168 PARPR	ATS1 MOUSE	ATS1_RAT	YHL1_EBV	FUS_MOUSE	YMV2_CAEEL	N214_HUMAN

ALIGNMENTS

	GUNK_FUSOX ID GUNK_FUSOX AC 94559; DT 01-NOV-1995 DT 10-OCT-2003 DB Putcative end DB glucanase) (1) OC Eukaryota; Po OC Bukaryota; Po OC Hyporrecomycei OX NCBI TaxiD=5:04 XEDLINE=5504 XEDLINE=5504 RE SEQUENCE FROM RE SEQUENCE FROM RE SEQUENCE FROM RE Gene 150:163 CC -i- CITALYTI CC -i- SIMILARI CC -i- SIMILARI	FUSOX GUNK FUSOX GUNK FUSOX STANDARD; p45599; p45599; p15099; p1-NOV-1995 (Rel. 32, Last seq p10-OCT-2003 (Rel. 42, Last ann putative endoglucanase type K glucanase) (Cellulase). Fusarium oxysporum. Bukaryota; Fungi; Ascomycota; Hypocreomycetidae; Hypocreales MCBLINE=5507; [1] SEQUENCE FROM N.A. MEDLINE=55047531; PubMed=79590 MEDLINE=55047531; PubMed=79590 MEDLINE=55047531; PubMed=79590 MEDLINE=5047531; PubMed=79590 Shoppard P.O., Grant F.J., Oxor Hagen F.S., Upshall A., McKnig "The use of conserved cellulas Gene 150:163-167(1994)	FUSOX FUSOX FUSOX FUSOX STANDARD; PRT; 376 FM15639; FM15639; FM15639; FM1-MOV-1995 (Rel. 32, Last sequence upda 10-OCT-2003 (Rel. 42, Last annotation up Futative endoglucanase type K precursor glucanase) (Cellulase). Fusarium oxysporum. Bukaryota; Fungi; Ascomycota; Pezizomyco Hypocreomycetidae; Hypocreales; mitospor MCBL_TaxID=5507; [1] FMEDLINE-95047531; PubMed=7959045; MEDLINE-95047531; PubMed=7959045; MEDLINE-95047531; PubMed=7959045; MEDLINE-95047531; PubMed=7959045; SEQUENCE FROM N.A. MEDLINE-95047531; PubMed=7959045; SEQUENCE FROM N.A. Genelinase of conserved cellulase family-s cellulase homologue cDNAs from Fusarium Gene 150:163-167(1994)	PUSOX STANDARD; 9; 9; 9; 97-1995 (Rel. 32, Last sec 17-2003 (Rel. 42, Last and 1 ve endoglucanase type K nase) (Cellulase). 1 ium oxysporum. 2 yota; Fungi; Ascomycota; 2 reomycetidae; Hypocreales 2 Taxil=5507; NCE FROM N.A. NE=55047531; PubMed=79590 ard P.O., Grant F.J., Oxy ard P.O., Grant F.J., Oxy ard P.O., Grant F.J., Oxy 1 phall A., McKnig use of conserved cellulas 1 phalonger conserved cellulas 2 phalonger conserved cellulas 3 phalonger conserved cellulas 4 phalonger conserved cellulas 5 phalonger conserved cellulas
--	--	--	--	--

between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch). CHAIN
DOMAIN
DOMAIN
DOMAIN
ACT_SITE
ACT_SITE
SEQUENCE SMART; SMUJZJS; LUGAL; 1.

PROSITE; PS01140; GLYCOSYL_HYDROL_F45; 1.

PROSITE; PS01140; GLYCOSYL_HYDROL_F45; 1.

Cellulose degradation; Hydrolase; Glycosidase; Signal.

SIGNAL 1 18 POTRNITAL.

CHAIN 19 376 PUTATIVE ENDOGLUCANASE TYPE K.

CHAIN 19 376 CATALYTC. InterPro; IPR009009; Barwin like.
InterPro; IPR000254; CBD fungal.
InterPro; IPR000334; Glyco_hydro_45.
Pfam; PF00734; CBM 1, 1.
Pfam; PF02011; Glyco_hydro_45; 1.
SMART; SM00236; fCBD; 1. EMBL; L29381; AAA65589.1; -. HSSP; P43316; 2ENG. 140 376 AA; 18 376 308 338 376 29 39235 MW; LINKER.
CELLULOSE-BINDING.
NUCLEOPHILE (BY SIMILARITY).
PROTON DONOR (BY SIMILARITY). B430A5F962B9F882 CRC64;

Query Match

56.8%;

Score 942.5; DB 1;

Length 376;

```
GUISTAN MANAGER RANGER 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Local
Matches 18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P43316;
C1-NOV-1995
X-RAY CRYSTALLOGRAPHY (1.5 ANGSTROMS).

Davies G.J., Dodson G.G., Moore M.H., Tolley S.P., Dauter Z.,
Wilson K.S., Rasmussen G., Schuelein M.;
"Structure determination and refinement of the Humicola insolens
endoglucanase V at 1.5-A resolution.";
Acta Crystallogr. D 52:7-17(1996)
-!- CATALYTIC ACTURITY: Endohydrolysis of 1,4-beta-D-glucosidic
linkages in cellulose, lichenin and cereal beta-D-glucans.
                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
Rasmussen G., Mikkelsen J.-M.,
Hjort C.M., Hastrup S.;
"A cellulase preparation compr:
Patent number WO9117243, 14-NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C1-NOV-1995 (Rel. 32, Created)
C1-NOV-1995 (Rel. 32, Last sequence update)
C10-CCT-2003 (Rel. 42, Last amoctation update)
Endoglucanase V (EC 3.2.1.4) (Endo-1,4-beta-glucanase (Cellulase V) (EG V).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GUN5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NIMDH
                                                                                                                                                                                                                                          Davies G.T., Dodson G.G., Hubbard R.E., Tolley S. Wilson K.S., Hjort C., Mikkelsen J.M., Rasmussen "Structure and function of endoglucanase V."; Rature 365:362-364(1993).
                                                                                                                                  Davies G.J., Tolley S.P., Henrissat B., Hjort "Structures of oligosaccharide-bound forms of from Humicola insolens at 1.9-A resolution.", Biochemistry 34:16210-16220(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Fungi; Ascomycota;
NCBI TaxID=34413;
                                                                                                                                                                                                                                                                                                         MEDLINE=93390621; PubMed=8377830;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Humicola insolens.
                                                                                                                                                                                                   MEDLINE=96101453; PubMed=8519779;
                                                                                                                                                                                                                 X-RAY CRYSTALLOGRAPHY (1.9 ANGSTROMS).
                                                                                                                                                                                                                                                                                                                         X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NIMDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ω,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ġτ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         φ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PVNKPKTTQKVRGTKTRGSCPAKTDATAKASVVPAYYQCGGSKSAYPNGNLACATGSKCV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCEGGGSAYACTNYSPWAVNDELAYGFAATKISGGSEASWCCACYALTFTTGPVKGKKMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TLLALAGPLAVSAASGSGHSTRYWDCCKPSCSWSGKAAVNAPALTCDKNDNPISNTNAVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQRLSDFNVQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KONEYYSOCV 374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KLNDYYSOCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGGGCTSQX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AKKTTSAAAAAQPQKTKDSAFVVQKSSTKPAAQPEPTKPADKPQTDKPVATKPAATKPAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PGCQWRFDWFQNADNPTFTFQQVQCFAEIVARSGCKRNDDSSFPVF-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VQSTNTGGDLGDNHFDLMMPGGGVGIFDGCTSEFGKALGGAQYGGISSRSECDSYPELLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GC-NGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DGCHWRFDWFENADNPDFTFEQVQCPKALLDISGCKRDDDSSFPAFKGDTSASKPQPSSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  49.5%;
                                                                                                                                                                                                                                                                                                                                                     comprising a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pred. No. le-6
6; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                          mitosporic Ascomycota; Humicola
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT:
                                                                                                                                                                                                                                                                                                                                                                                                Schulein M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  No. 1e-61;
                                                                                                                                                                                                                                                                                                                                                                   an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TPPS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  213
                                                                                                                                                                                                                                                                                                                                                                   endoglucanase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                Patkar S.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WAQCGGIGF---SGCTTCVSGTTCQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----GGNGGTGTFTSTAPGSGQTSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  72;
                                                                                                                                                                     c.,
                                                                                                                                                                                                                                                                          ٠. ك
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                     Schuelein M.;
endoglucanase
                                                                                                                                                                                                                                                                          Dauter Z.,
Schuelein M.;
                                                                                                                                                                                                                                                                                                                                                                   enzyme.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5
                                                                                                                                                                                                                                                                                                                                                                                                Hagen F.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6
                                                                                                                                                                                                                                                                             Ş
                                                                                           片
                                                                                                                      Ś
                                                                                                                                                       片
                                                                                                                                                                                 8
      Ş
                                  뮍
                                                                                                                                                                                                                 Query Match
Best Local S
Matches 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PROSITE; PSO1140; Cellulose degradat.
ACT_SITE 10
ACT_SITE 121
STRAND 2
STRAND 12
HELIX 15
HELIX 15
STRAND 24
STRAND 24
STRAND 31
STRAND 31
STRAND 37
TURN 41
STRAND 37
TURN 45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HELIX
STRAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TURN
STRAND
STRAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TURN
TURN
STRAND
TURN
STRAND
TURN
STRAND
TURN
STRAND
TURN
TURN
TURN
HELIX
TURN
STRAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ÷
                                                                                                                                                                                                                                                                                                                         HELIX
STRAND
                                                                                                                                                                                                                                                                                                                                                                                                                XI TELL IX
                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pfam;
                                                                                                                                                                                                                                                                                                                                                                                                 HELIX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           InterPro;
                                                                                                                                                                                                                                                                                                            TUR!N
                                                                                                                                                                                                                                                                                                                                                                                                                                                             ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIMILARITY: Belongs hydrolases).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4ENG; 16-JUN-97.
1HD5; 03-JUL-01.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2ENG; 08-DEC-96.
3ENG; 16-JUN-97.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            123
                                                                145
                                                                                                                                                                                                                    157;
                                                                                              63
                                                                                                                            85
                                                                                                                                                                                     26
                                                                                                                                                        w
                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECDRFPDALKPGCYWRFDWFKNADNPSF
                                                       AMPGGGVGIFNGCSSQFGGIFGAQYGGISSRDQCDSFPAPLKPGCQMRFDWFQNADNPTF
                                                                                                                    AVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMVVQSTSTGGDLGSNQFDI
                                                                                                                                                                             GQSTRYMDCCKPSCAMPGKAAVSQPVYACDANFQRLSDFNVQSGCN-GGSAYSCADQTPW
         TFQQVQCPAEIVARSGCKRNDDSSFPVFTPP
                                                                                                                                                        GRSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQRITDFDAKSGCEPGGVAYSCADQTPW
                                                                                              AVNDDFALGFAATSIAGSNEAGWCCACYELTFTSGFVÄGKKMVVQSTSTGGDLGSNHFDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IPR009009;
                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                              AA;
                                                                                                                                                                                                                                                                           206
22864 MW;
                                                                                                                                                                                                                                                                                                           148
149
158
163
171
171
173
176
187
197
201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Barwin
                                                                                                                                                                                                                                 55.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ť
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cellulase family K (family 45 of
                                                                                                                                                                                                                    27;
                                                                                                                                                                                                                 Score 921.5;
Pred. No. 1.9e
27; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PROTON DONOR
                                                                                                                                                                                                                                                                                24334301BA3BC804 CRC64;
                                                                                                                                                                                                                                    .9e-60;
                                                                                                                                                                                                                                                DB 1;
                                                                                                                                                                                                                      26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3D-structure.
                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     glycosyl
                                                                                                                                                                                                                    <u>.</u>
                                                                     204
                                                                                                                             144
                                                                                                                                                                                         84
                                                                                                   122
                                                                                                                                                           62
                                        182
```

밁 8 윉

S

Ø 맑 Ś

Ş 밁 Ş

В

片

엉

183

:[:|||]||:|||:||| :|| sergvyceaelvarigcrrnddgnfpavgip 213

GUNB

PSEFL

STANDARD;

PRT;

511

```
P18126;
01-NOV-1990
01-NOV-1990
             ACT_SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "The N-terminal region of an endoglucanase from Pseudomonas fluorescens subspecies cellulosa constitutes a cellulose-binding domain that is distinct from the catalytic centre.";
MOL Microbiol. 4:759-767(1990).
-I- FUNCTION: THIS ENZYME CAPALYZES THE ENDOHYDROLYSIS OF 1,4-BETA-GLUCONIDIC LINKAGES IN CELLULOSE, LICHENIN AND CEREAL BETA-D-GLUCANS. ESB IS MOST ACTIVE AGAINST BARLEY BETA-GLUCAN, BUT SHOWE SIGNIFICANT ACTIVITY AGAINST AMORPHOUS AND CRISTALLINE CELLULOSE.
                                                                        DOMAIN
                                                                                                                                                                         Pfam; PF02013; CBM 10; Pfam; PF00553; CBM 2; 1 Pfam; PF02015; Glyco hy SMART; SM00637; CBD II;
                                                                                                                                                                                                                            InterPro; IPR009009; Barwin_like.
InterPro; IPR009031; CBDX.
InterPro; IPR009055; Cellul bind.
InterPro; IPR002883; Dockerin CBD 5.
InterPro; IPR000334; Glyco_hydro_45.
                                                                                                                                                                                                                                                                                                                                                                        entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                        use by non-profit institutions as long as its content modified and this statement is not removed. Usage by an
                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gilbert H.J., Hall
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01.NOV-1990 (Rel. 16, Created)
01-NOV-1990 (Rel. 16, Last sequence update)
10-CCT-2003 (Rel. 42, Last annotation update)
Endoglucanase B precursor (EC 3.2.1.4) (Endo-1,4-beta-glucanase)
                                                                                                                                                                                                                                                                                                                                                                                                                                    the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=90355836; PubMed=2117693;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=Sp.
                                                         DOMAIN
                                                                                                                  SIGNAL
                                                                                                                                                          PROSITE;
                                                                                                                                                                                                                                                                                                                     HSSP;
                                                                                                                                                                                                                                                                                                                                   PIR; S10527; S10527.
                                                                                                                                                                                                                                                                                                                                                EMBL; X52615;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pseudomoradaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria; Proteobacteria; Gammaproteobacteria; Pseudomonadales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pseudomonas fluorescens.
   SEQUENCE
                                                                                                                                                                                                                                                                                                     InterPro; IPR001919; Bac_celose-bind
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (Cellulase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CATALYTIC ACTIVITY: Endohydrolysis of 1,4-beta-D-glucosidic linkages in cellulose, lichenin and cereal beta-D-glucans. SUBCELULAR LOCATION: Periplasmic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SIMILARITY: Contains 1 bacterial-type cellulose-binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SIMILARITY: Belongs to cellulase family K (family 45 of glycosyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             hydrolases).
                                                                                                                                                                                                                                                                                                                     P43316;
                                                                                                                                              PS01140; GLYCOSYL HYDROL F45; 1.
                                                                                                                              degradation;
30
132
132
223
223
32
276
393
                                                                                                                                                                                                                                                                                                                     2ENG
                                                                                                                                                                                                                                                                                                                                                CAA36844.1; -.
   £
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pseudomonas
                                                                                                                                                            B
                29
511
131
173
173
259
259
127
276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AND SEQUENCE OF
   52078
                                                                                                                                                                                    hydro_45; 1.
                                                                                                                                                            BACTERIAL; 1.
                                                                                                                               Hydrolase; Glycosidase; Signal; Periplasmic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Hazlewood G.P., Ferreira L.M.A.;
   W.
 NUCLEOPHILE (BY SIMILARITY).
PROTON DONOR (BY SIMILARITY).
3C3119D998291D8E CRC64;
                                          SER-RICH.
BY SIMILARITY.
                                                                                    ENDOGLUCANASE B. CELLULOSE-BINDING
                                                                        SER-RICH (LINKER)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          30-48
                                                                                                                                                                                                                                                                                                                                                                                                                                    There are no restrictions on
                                                                                       YB)
                                                                                     SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                           and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (CBD)
                                                                                                                                                                                                                                                                                                                                                                                                           for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BUT SHOWED
```

```
GUN1 US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   맔
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ś
      맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                돲
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  USTMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GUN1 US
P54424;
InterPro; IPR009009; Barwin like.
InterPro; IPR009334; Glyco_hydro_45.
Pfam; PF02015; Glyco_hydro_45; 1.
PR0SITE; PS01140; GLYCOSYL_HYDROL_F45; 1.
Cellulose degradation; Hydrolase; Glycosidase; Signal; Glycoprotein.
SIGNAL 26
POTENTIAL.
                                                                                              EMBL; S81598; AAB36147.1;
PIR; S59499; S59499.
HSSP; P43316; ZENG.
                                                                                                                                                                                        the European Bioinformatics Institute. There are no restricti
use by non-profit institutions as long as its content is
modified and this statement is not removed. Usage by the
                                                                                                                                                                                                                                                                                                                                                                                                               Biol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Endoglucanase 1 precursor
(Cellulase 1) (EG 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-OCT-1996 (Rel. 34,
01-OCT-1996 (Rel. 34,
28-FEB-2003 (Rel. 41,
                                                                                                                                                                                                                                      This SWISS-PROT entry is copyright. It is produbetween the Swiss Institute of Bioinformatics
                                                                                                                                                                                                                                                                                                                                                                                                 +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bukaryota; Fungi; Basidiomycota; Ustilaginomycetes;
Ustilaginomycetidae; Ustilaginales; Ustilaginaceae;
                                                                                                                                                            or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                           Schauwecker F., Wanner G., Kahmann R.;
"Filament-specific expression of a cellulase gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=FBD11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ustilago maydis (Smut fungus)
                                                                                                                                                                            entities requires a license agreement (See http://www.isb-sib.ch/amnounce/
                                                                                                                                                                                                                                                                                                                                                                                                                            fungus Ustilago maydis."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=96145728; PubMed=8590631;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                                                                                                                                                  DEVELOPMENTAL STAGE: EXPRESSED IN FILAMENTOUS DIKARYON.
PTM: May also be O-glycosylated.
SIMILARITY: Belongs to cellulase family K (family 45 of glycosyl
                                                                                                                                                                                                                                                                                                                                                                  linkages in cellulose, lichenin and cereal SUBCELLULAR LOCATION: Secreted.
                                                                                                                                                                                                                                                                                      hydrolases).
                                                                                                                                                                                                                                                                                                                                                   TISSUE SPECIFICITY: HYPHAL TIP.

    Chem. Hoppe-Seyler 376:617-625 (1995).
    CATALYTIC ACTIVITY: Endohydrolysis of 1,4-beta-D-glucosidic

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  USTMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ដ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2 RSTPVLRTTLAAALPLVASAASG-----SGQSTRYWDCCKPSCAWPGKA-AVSQPVY 52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WFEAADNPSLKYKEVPCPAELTTRSGMNRS 501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        G---GLPGAQYGGISSR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ALTET----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SCSANNTRLSDVSVGSSCDGGGGYMCWDKIPFAVSPTLAYGYAAT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ACDANEORISDENVOSGCNGGSAYSCADOTEWAVNDNLAYGEAATSIAGGSESSWCCACY 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RSSVASSSSISSATSSSASSVSSVPPIDGGCNGYATRYWDCCKPHCGWSANVPSLVSPLQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WFQNADNPTFTFQQVQCPAEIVARSGCKRN 224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVSNAELGAQYGGFLAACKQQLGYNASLSQYKSCVLNRCDSVFGSRGLTQLQQGCTWFAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QLQFTGSSYNAPGDPGSAALAGKTMIVQATNIGYDVSGGQFDILVPGGGVGAFNACSAQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        30.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Last sequence update)
Last annotation update)
rsor (EC 3.2.1.4) (Endo-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -- SGPVAGKTMVVQSTSTGGDLGSNQEDIAMPGGGVGIFNGCSSQF 161
                                                                                                                                ŀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 507; DB 1;
Pred. No. 6.5e-30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                       It is produced through
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Endo-1,4-beta-glucanase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DOCDSF----PAPLKPGCOWRFD
                                                                                                                                                                                                                                                                                                                                                                                  beta-D-glucans
                                                                                                                                                                                                                                          and the EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 511;
                                                                                                                                                                                                                                                                                                                                                                                                                                              ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ustilago
                                                                                                                                                                                                                                                                                                                                                                                                                                              the dimorphic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               52;
                                                                                                                                                                                                                                              a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -SSGDVCGRCY
                                                                                                                                                                                              for
                                                                                                                                                                                                             ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                              commercia.
                                                                                                                                                                                                             ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     351
```

and for

commercial

no g

```
RABBIETA
RAB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             뭐
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FAEB PENFN
Q9HE18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PENEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CHAIN
ACT_SITE
ACT_SITE
DOMAIN
  ÷
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       28-FEB-2003
28-FEB-2003
                                       1
                                                                                                                                                             -i-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                              ferulic acid from plant cell walls and binds contains a carbohydrate binding module."; Eur. J. Biochem. 267:6740-6752(2000).
                                                                                                                                                                                                                                      Kroon P.A., Williamson G., Fish N.M., Archer D.B., Belshaw N.J.;
NA modular esterase from Penicillium funiculosum which releases
                                                                                                                                                                                                                                                                              MEDLINE=20534747; PubMed=11082184;
                                                                                                                                                                                                                                                                                                259-274, FUNCTION,
STRAIN=IMI 134756;
                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Fungi; Ascomycota; Pezizomycotina; Eurotiomycetes;
Eurotiales; Trichocomaceae; mitosporic Trichocomaceae; Penici
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10-OCT-2003 (Rel. 42, Last annotation update)
Feruloyl esterase B precursor (EC 3.1.1.73) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=28572;
                                                                                                                                                                                                                                                                                                                                                                                                                                       Penicillium funiculosum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                              FAEB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FAEB)
                                                                          the feruloyl-galactose and feruloyl-arabinose ester bonds in pectin. Binds strongly to cellulose.
CATALYTIC ACTIVITY: Feruloyl-polysaccharide + H(2)0 = ferulate
  SUBCELLULAR LOCATION:
                                       polysaccharide.
ENZYME REGULATION: Inhibited
                                                                                                                                       FUNCTION: Involved in degradation of plant cell walls. Hydrolyzes the feruloyl-arabinose ester bond in arabin
                      inhibitor AEBSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   115;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (Cirnamoyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SNPGAAQGGQGG 377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QPEGYGQPSGGNDQGSSNGDATTGAGSGSGSGSDSGSTANGSGSGAPTSGSDGSAVAPPSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----PPSGGN--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SGKVDSANTAAPAQYKRDRSVCLAGGKKGKSAAGGVDGSGDASGGADASGAGGAAEGSQG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TECSKLPKPLQESCKWRFSEW---GDNPVLKGSPKRVKCPKSLIDRSGCQRKDDNTISPY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DQCDSFPAPLKPGCQWRF-DWFQNADNPTF--TFQQVQCPABIVARSGCKRNDDSSFPVF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TM-----VVQSTSTGGDLGSNQFDIAMPGGGVGIF-NGCSSQFG---GLPGAQYGGISSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QSGCNGGNKFMCSCMQPFDDETDPTLAFGFGA--FTTGQESDTDCACFYAEF-EHDAQGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QSGCNGGSAYSCADQTPW--AVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LSISISIVHIDGVRAGMATRYWDCCLASASWEGKAPVYAPVDACKADGVTLIDSKKDPSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LAAALPLVASAASGSGQSTRYWDCCKESCAWPGKAAVSQPVYACDANFQRL----SDPNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SGCTSQKWAQCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AMKRNKLIFQVTNVGGDVQSQNFDFQIPGGGLGAFPKGCPAQWGVBASLWGDQYGGVKSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            27
34
152
270
270
343
393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (Rel. 41, (Rel. 42,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (Rel. 41, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ß
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 esterase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     393
34
152
385
343
                                                                                                                                                                                                                                                                                                                 SUBCELLULAR LOCATION, AND INDUCTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  39594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Last sequence update)
  Secreted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                XX.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 462; DB 1;
Pred. No. 9.3e-27;
(1; Mismatches 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N-LINKED (GLCNAC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ENDOGLUCANASE 1.
NUCLEOPHILE (BY SIMILARITY).
PROTON DONOR (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ALA/GLY/SER-RICH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              65C753C610CD6AD3 CRC64
                                       λq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   353
                                       specific
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ĀĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (Ferulic acid esterase
                                                                                                                                                                                                                     crystalline cellulose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 393;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGTGTFTSTAPGSGQTSPGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .) (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels 116;
                                                                                                                                         arabinoxylans,
                                                                                                                                                                                                                                                                                                                                      212-241 AND
                                                                                                                                                                                                                                                                                                                                                                                                  Penicillium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                           and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    四
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        233
RESULT 6
GUN5_TRIRE
                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 당
                                                                                                                                                           밁
                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                     片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                          문
                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                    뮍
                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DOMAIN
DOMAIN
DOMAIN
ACT SITE
CARBOHYD
CARBOHYD
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 InterPro; IPR000254; CBD_fungal
InterPro; IPR000379; Ser_estrs.
Pfam; PF00734; CBM_1; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              88888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HSSP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -!- INDUCTION: Repressed by glucose, probably via the carbon catabolite repressor protein CreA.
-!- PTM: 619cosylated (Probable).
-!- SIMILARITY: Contains 1 fungal-type cellulose-binding (CBD) domain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hydrolase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PROSITE; PS00562; CBD_FUNGAL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GO:0005576; C:extracellular; IDA.
GO:0030240; F:cellulose binding; IDA.
GO:0030600; F:feruloyl esterase activity;
GO:0016990; P:cell wall catabolism; IDA.
GO:0045490; P:pectin catabolism; IDA.
GO:0045493; P:xylan catabolism; IDA.
                                                                                 328
                                                                                                                    274
                                                                                                                                                             268 AYSAAGVGHFVPTDVSVVLDWFGITSGTTTTTTTTTTTTTSTSPSSTGGCTAAHWAQCGG
                                                                                                                                                                                                                                                                                                                       154
                                                                                                                                                                                                                                                                                                                                                                                                    107
                                                                                                                                                                                                                                                                                                                                                                                                                                           103
                                                                                                                                                                                                                                                                                194 D-WFQNADNP-----
                                                                                                                                                                                                                                                                                                                                                            156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P00725;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AJ291496; CAC14144.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12 LLPVVLAASLTQVNNFGDNFGSLQMY-----IYVPNKLA-SKPAIIVAMHPC-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; PD001821; CBD_fungal; 1.
SM00236; fCBD; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6 VIRTTLAAALPIVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQP-----VYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                              -SES
                                                                                                                                                                                                                                                                                                                                                               GCSSQFGGLPGA-QYGG----ISSRDQCDSFPAPLKPGCQW---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LSDFNVQSGCNGGSA-----
                                                                                 IGYSGCTACASPYTCQKANDYYSQCL
                                                                                                                    IGESCCTTCVSGTTCQXLINDYYSQCL
                                                                                                                                                                                                                                        QMWHGTADNVISYADLGQEISQWTTIMGLSFTGNQTNTPL---
                                                                                                                                                                                                                                                                                                                     AAGSAFSGMPYACLYGAGAADPIMSNOTCSQGQIQ-HTGQQWAAYVHNGYPGYTGQYPRI
                                                                                                                                                                                                                                                                                                                                                                                                    SDSLSIVNMVKYVISTYG-----ADSSKVYMTGSSSGAIMTN----VLAGAYPDVF-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Serine esterase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2CBH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ÃÃ,
                                                                                                                                                                                                                                                                                                                                                                                                                                       ---SWCCACYALIFISGPVAGKIMVVQSTSIGGDLGSNQEDIAMPGGGVGIFN 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             353
291
318
353
136
179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         246 1
37333 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -ĠĠŚĀTEYYGMYDYHŚPÁDQYGYILIYPSATRDYNCEDAYSSASLTHNGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               14.9%;
27.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Xylan degradation; Glycoprotein; Signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 247; DB
Pred. No. 3.6e
28; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-LINKED (GLCNAC. ..) (POTENTIAL)
N-LINKED (GLCNAC. ..) (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRO/SER/THR-RICH (LINKER).
CELLULOSE-BINDING (PROBABLE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FERULOYL ESTERASE B. CATALYTIC (PROBABLE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CHARGE RELAY SYSTEM.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ---YSCADQ-----TPWAVND-NL--AYGFAATSIAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4AD08FEDDA29B2D9 CRC64;
                                                                                                                                                                                                 NGGTGTPTSTAPGSGQTSPGGGSGCTSQXWAQCGG
                                                                                 353
                                                                                                                      299
                                                                                                                                                                                                                                                                                -TFTFQQVQCPAEIVARSGCKR---NDDSSFP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      There are no restrictions ong as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 1;
3.6e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               116;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IDA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 353;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                            -SGYTKMVYGDGSKFQ
```

136;

Gaps

21;

Ŗ

106 102 57

212 193 153

230

273 267

327

맑 Ś S

Ş 당

```
Ş
                      D
                                             8
                                                                                                                                                                          Вb
                                                                                         Š
                                                                                                                        Query Match
Best Local S
Matches 78
                                                                                                                                                                                                            DOMAIN
CARBOHYD
                                                                                                                                                                                                                                                            CHAIN
ACT_SITE
ACT_SITE
                                                                                                                                                                                                                                                                                                                                      PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mol. Microbiol. 13:219-228(1994).
-!- CATALYTIC ACTIVITY: Endohydrolysis of 1,4-beta-D-glucosidic linkages in cellulose, lichenin and cereal beta-D-glucans.
                                                                                                                                                                                                                                     DOMAIN
                                                                                                                                                                                                                                                                                                                                                                 InterPro: 1. 1. 1. Pfam; P700734; CBM 1; 1. Pfam; P702015; Glyco hydro 45; 1. Pfam; P702015; CBD fungal; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       asu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hypocreomycetidae;
NCBI_TaxID=51453;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Trichoderma reesei (Hypocrea Eukaryota; Fungi; Ascomycota;
                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                     DISULFID
                                                                                                                                                                                                DISULFID
                                                                                                                                                                                                                                                                                                  SIGNAL
                                                                                                                                                                                                                                                                                                               Cellulose
                                                                                                                                                                                                                                                                                                                                                            ProDom; PD001821; CBD_
SMART; SM00236; fCBD;
                                                                                                                                                                                                                                                                                                                                                                                                                       InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            PIR; S60143; S60143.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            modified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "A novel, small endoglucanase gene, isolated by expression in yeast.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Saloheimo A., Henrissat B., Hoffren
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=QM9414 / Rut C-30;
MEDLINE=95075308; PubMed=7984103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Endoglucanase (Cellulase V)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10-OCT-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-NOV-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-NOV-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          P43317;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GUNS TRIRE
                                                                                                                                                                                                                                                  DOMAIN
                                                                                                                                                                                                                                                                                                                         PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                    InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   HSSP; P00725;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             hydrolases).
SIMILARITY: Contains 1 fungal-type cellulose-binding (CBD) domain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIMILARITY: Belongs to cellulase family K (family 45 of glycosyl
 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Z33381;
                        60
                                                                                                                                                                                                                                                                    2015,

20001821; Cbb...

2P001821; Cbb...

2; PS00562; CBD FUNGAL; 1.

2; PS509642; EXPĀNSIN_EG45; 1.

8001140; GLYCOSYL HYDROU, F45; 1.

9001811AL.

901811AL.

901811AL.

901811AL.

901811AL.

901811AL.

901811AL.

901811AL.

901811AL.
                                              60
                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and this statement
                        ALFDTAGASWCGAG
                                              RLSDFNVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFT--
                                                                       MKATLVLGSLIVGAVSAYKATTTRXYDGQEGACGCGSSSGAPPWQLGIGNGVYTA-AGSQ
                                                                                               LRTTLAAALPLVASAASGSGQSTRYWD-----CCKPSCAWPGKAAVSQPVYACDANPQ
                                                                                                                                                                                                                                                                                                                                                                                                         IPR000254; CBD fungal.
IPR007112; Expan endogl.
IPR000334; Glyco_hydro_45.
                                                                                                                                                                     213
224
242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (Rel. 32, Created)
(Rel. 32, Last sequence upd
(Rel. 42, Last annotation u
se V precursor (EC 3.2.1.4)
                                                                                                                                                                                                           18
183
206
182
                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                   ZCHH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            V precursor (EG V).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CAA83846.1;
                                                                                                                                                                        AA;
--SGPVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                           242
134
182
205
242
182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Hypocreales;
                                                                                                                                    13.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      institutions as long
                                                                                                                                                                         24411
                                                                                                                                                                         Œ,
                                                                                                                       39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          is not removed
                                                                                                                       Score 221; DB 1;
Pred. No. 1.9e-09;
9; Mismatches 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         jecorina).
; Pezizomycotina;
es; Hypocreaceae;
                                                                                                                                                                                    BY SIMILARITY.
BY SIMILARITY.
                                                                                                                                                                                                          PRO/SER-RICH (LINKER).
CELLULOSE-BINDING (BY SIMILARITY)
N-LINKED (GLONAC. ...) (POTENTIAL
                                                                                                                                                                                                                                               PROTON DONOR (BY SIMILARITY).
CATALYTIC.
                                                                                                                                                                                                                                                                        NUCLEOPHILE (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                         CC033FC51326C71D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A.-M., Teleman O., Penttilae egl5, from Trichoderma reesei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                upćate)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (See http://www.isb-sib
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Endo-1,4-beta-glucanase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      as its content
                                                                                                                        101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Usage by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sordariomycetes; Hypocrea.
                                                                                                                                                                                                                                                                                                            Signal
                                                                                                                                              Length 242;
                                                                                                                        Indels
                                                                                                                                                                                                             (POTENTIAL).
                       CGKCYQLTSTGQ
                                                                                                                        98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       reesei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .ch/announce/
                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          commerci
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ij
                       (B)
                                                                        Ş
                                              117
                                                                                               59
```

```
RESULT
GUX1_TR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
 맑
                               reesei.":
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               21-UHL-1986 (Rel. 01, Created)
21-UHL-1986 (Rel. 01, Last sequence update)
10-OCT-2003 (Rel. 42, Last annotation update)
Exoglucanase I precursor (EC 3.2.1.91) (Exoce
[CBHI] (1,4-beta-cellobiohydrolase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GUX1 TR
                                                                                                                                                                                                                                                                                                                      "Molecular cloning and sequence analysis of the gene from Trichoderma koningii G-39."; Curr. Microbiol. 28:31-39(1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                               Myambo K., Innis M.; 
*Molecular cloning of exo-cellobiohydrolase I derived from Trichoderma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SPECIES=T.reesei; STRAIN=127; SPECIES=T.reesei; STRAIN=127; Schweickart V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bukaryota; Fungi; Ascomycota; Pezizomycotina;
Hypocreomycetidae; Hypocreales; Hypocreaceae;
MCBI TaxID=51453, 55202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TRIRE
 STRUCTURE
                                                           Divne C., Staahlberg J., Teeri T.T., Jones "High-resolution crystal structures reveal
                                                                                  SPECIES=T.reesei; STRAIN=QM9414
MEDLINE=98128795; PubMed=9466911
                                                                                                                                               "The three-dimensional crystal structure of cellobiohydrolase I from Trichoderma reesei
                                                                                                                                                                        Divne C., Staahlberg J., Reinikainen T.
Knowles J.K.C., Teeri T.T., Jones T.A.,
                                                                                                                                                                                                MEDLINE=94310436; PubMed=8036495;
                                                                                                                                                                                                                                   Tomme P., Clayssens M.;
"Identification of a functionally important cellobiohydrolase I from Trichoderma reesei. FEBS Lett. 243:239-243(1989).
                                                                                                                                                                                                                                                                                    SPECIES=T.reesei;
                                                                                                                                                                                                                                                                                                                                                           Wey T.T., Hseu T.H.,
                                                                                                                                                                                                                                                                                                                                                                                                                        reesei strain L27.";
Biotechnology 1:691-696(1983)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CBHI
           9
                                                                                               K-RAY CRYSTALLOGRAPHY (1.7 ANGSTROMS) OF 18
SPECIES=T.reesei; STRAIN=QM9414 / Rut C-30;
                                                                                                                                                                                                            K-RAY CRYSTALLOGRAPHY (1.81 ANGSTROMS)
                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=94100788;
                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Trichoderma koningii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Crichoderma reesei
                                                                                                                                      cience 265:524-528(1994).
                                                                                                                                                                                                                                                                                                CTIVE SITE
                        Mol. Biol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TRIRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98
                                               the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APCSSCGTGGAAGQSIIVMVTNLCPNNGNAQWCPVV--GGTN--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APGTCKVQNQWYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SCITCOKLNDYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NDDSSEPVFTPPSGGNGGTGTPTSTAPGSGQTSGGGSGCTSQKWAQCGGTGFSGCTTCV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GISSRDQCDSFPAPLKPGCQWRFD-WFQN---ADNPTFTFQQVQCPAEIVARSG---CKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QQETD-P--TPVLGNDTGSTPPGSSPPATSSSPPSGGGQQT--LYGQCGGAGWTGPTTCQ
¥Υ
                                                                                                                                                                                                                                                                                                                                                                                     koningii;
 Z
                                              50 A long
                        275:309-325 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STANDARD;
 OF 478-513
                                                                                                                                                                                                                                                                                                                                                                         PubMed=7764306;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (Hypocrea jecorina),
                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=G-39;
                                                                                                                                                                                                                                                                                                                                                            Huang L .;
                                               tunnel of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GYSYHFDIMAQNEIFGDNVVVDFEPIACPGQAASDWGTCLCVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ladner M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                 ces reveal how a c
                                                                                                                                                                                                                                                 reesei.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        513
                                                                                                                                                                                                             OF 18-452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (Exocellobiohydrolase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                             18-452
                                                                                                                                                                                    Ruohonen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gelfand
                                                                        T.A.;
                                                                                                                                                             the catalytic
                                                                                                                                                                                                                                                            carboxyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hypocrea.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sordariomycetes;
                                                            a cellulose
                                                                                                                                                                                                                                                                                                                                                  cellobiohydrolase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .
                                                                                                                                                                                    ۲
                                                                                                                                                                                                                                                            dronb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Kwok
                                                                                                                                                                                      Pettersson
                                                                                                                                                              core
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                            chain
                                                                                                                                                              of
f
                                                            18
                                                                                                                                                                                      G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ģ=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       127
```

```
InterPro; IPR000254; CBD_fungal.
InterPro; IPR000985; ConA like lec_gl.
InterPro; IPR001722; Glyco_hydro_7.
Pfam; PF00734; CBM_1; 1.
Pfam; PF00734; CBM_1; 1.
Pfam; PF001840; Glyco_hydro_7; 1.
PrcDom; PD001821; CBD_fungal; 1.
PrcDom; PD0185135; Glyco_hydro_7; 1.
SMART; SM00236; ECBD; 1.
SMART; SM00236; ECBD; 1.
Cellulose degradation; Hydrolase; Glycos.
                                                                                                                                                                                                                                                                                                                                     Kraulis P.J., Clore G.M., Nilges M., Jones T.A., Pettersson G., Knowles J., Gronenborn A.M.; "Determination of the three-dimensional solution structure of the terminal domain of cellobiohydrolase I from Trichoderma reesei. A study using nuclear magnetic resonance and hybrid distance geometry-dynamical simulated annealing.";
                                                            This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBI outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                        PDB;
                                                                                                                                                       or send an
                                                                                                                                                                                                                                                                                                              SPECIES=T.reesei;
MEDLINE=97194052; PubMed=9041630;
                                                                                                                                                                                                                                                                                                                                                              SPECIES=T.reese;
MEDLINE=90057416; PubMed=2554967;
Clore G.M., Nilges M.,
                                                                                                                                                            entities requires a
 3D-structure;
                                                                                                                                                                                                                                                                                                                         STRUCTURE BY NMR OF 478-513.
                                                                                                                                                                                                                                                                                                                                    Bicchemistry
                                                       X69976; CAA49596.1;
AD0902; EUTQI.
                                                       12-MAR-97
24-DEC-97
24-DEC-97
24-DEC-97
15-JAN-90
15-JAN-90
18-APR-98
08-APR-98
29-APR-98
29-APR-98
16-MAY-01
16-MAY-01
25-FBB-98
                                                                                                                         12-MAR-97
12-MAR-97
                                                                                                                                                       equires a license agreement (S email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                    28:7241-7257(1989).
562; CBD_FUNGAL; 1.
radation; Hydrolase; Glycosidase; Glycoprotein; Signal;
Pyrrolidone carboxylic acid.
                                                                                                                                                           noved. Usage by and for commercial (See http://www.isb-mib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                       Ģ
      DISULFID
DISULFID
DISULFID
                                                                                                                                                                                                                                                                CARBOHYD
CARBOHYD
DISULFID
                                                                                                                                                                                                                                                                                                                                       DOMAIN
ACT_SITE
ACT_SITE
ACT_SITE
                                                                                                                                                                                               TURN
STRAND
HELIX
STRAND
TURN
STRAND
STRAND
TURN
                                                                                                                                                                                                                                       STRAND
STRAND
     TURN
TURN
TURN
STRAND
TURN
STRAND
TURN
STRAND
TURN
STRAND
TURN
STRAND
STRAND
STRAND
STRAND
STRAND
STRAND
STRAND
STRAND
                                                                                                TURN
TURN
STRAND
                                                                                                              TURN
                                                                                                                         STRAND
TURN
TURN
STRAND
TURN
STRAND
TURN
STRAND
                                                                                                                                                                                                                                                                                                                                                                SIGNAL
CHAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                         CARBOHYD
                                                                                                                                                                                                                                                                                                                              CARBOHYD
                                                                                                                                                                                                                                                                                                                                   MOD RES
     PYRROLIDONE CARBOXYLIC /
N-LINKED (GLCNAC. . .)
N-LINKED (GLCNAC. . . .)
N-LINKED (GLCNAC. . . .)
N-LINKED (GLCNAC. . . .)
                                                                                                                                                                                                                                                                                                                                       NUCLEOPHILE.
PROTON DONOR.
                                                                                                                                                                                                                                                                                                                                                                 EXOGLUCANASE CATALYTIC.
                                                                                                                                                                                                                                                                                                                                                  PROBABLE
                                                                                                                                                                                                                                                                                                                                                       CELLULOSE-BINDING
                                                                                                                                                                                                                                                                                                                                                            LINKER.
                                                                                                                                                                                                                                                                                                              C ACID.
) (POTENTIAL)
) (POTENTIAL)
) (POTENTIAL)
) (POTENTIAL)
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GUX1 TRIVI
P19355;
01-NOV-1990
                             entities requires a license agreement ( or send an email to license@isb-sib.ch)
                                                                                         This SWISS-PROT entry is copyright. It is produced through a c
between the Swiss Institute of Bioinformatics and the EMBL
the European Bioinformatics Institute. There are no restrict
                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=91016856; PubMed=2216737;
Cheng C., Tsukagoshi N., Udaka S.;
"Nucleotide sequence of the cellobiohydrolase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-NOV-1990
10-OCT-2003
EMBL; X53931; CAA37878.1;
                                                                                                                                                                                                                                                                                                                                                   Eukaryota; Fungi; Ascomycota; Fezizomycotina; Sordariomycetes;
Hypocreomycetidae; Hypocreales; mitosporic Hypocreales; Trichoderma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TRIVI
                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Trichoderma viride.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              beta-cellobiohydrolase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                                     in celiulose and cellotetraose, releasing reducing ends of the chains. SIMILARITY: Belongs to cellulase family C
                                                                                                                                                                                                                               generally requires three types of hydrolytic enzymes: (1)
Endoglucanases which cut internal beta-1,4-glucosidic bonds; (2)
Exoceliobiohydrolases that cut the dissaccharide cellobiose
from the nonreducing end of the cellulose polymer chain; (3)
Beta-1,4-glucosidases which hydrolyze the cellobiose and other
short cello-oligosaccharides to glucose.
CATALYTIC ACTIVITY: Hydrolysis of 1,4-beta-D-glucosidic linkages
                                                                                                                                                       SIMILARITY: Contains 1 fungal-type cellulose-binding (CBD) domain.
                                                                                                                                                                         hydrolases).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             91;
                                                          non-profit institutions as long and this statement is not removed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKTMYVQSTSTGGDLG----SNQFDIAMEGGGVGIFNG-----CS---SQFGGLPGAQ 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GTYSDNRYGGTCDPDGCDWNPYRLGNTSFYG-----PGSS----FTLDTTK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SAYS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PSSNNANTGIG---GHGSCCSEMDIWEAN-SISEALTPHPCTTVGQEICE---GDGC--G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPV--YACDANFQRLSDFNVQSGCNGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPTQSHYGQCGGIGYSGPTVCASGTTCQVLNPYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GVPAQVESQSPNAKVTFSNIKFGPIGSTGNPSGGNPFGGNRGTTTTRRPA---TTTGSSP 475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KGGLTQFKXATSGGMVLVMSL-WD-DYYANMLWLDSTYPTNETSSTPGAV--RGSCSTSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YGGISSRDQCDSFFAFLKPGCQWRFDWFQN---ADNPTFTFQQVQCFAEIVARSGCKRND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -KLTVVTQFETSGAINRYYVQNGVTFQQPNAELGSYSGNELNDDYCTAEBAEFGGSSFSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Rel. 16, Created)
(Rel. 16, Last sequence update)
(Rel. 42, Last annotation update)
e I precursor (EC 3.2.1.91) (Exocellobiohydrolase) (1,4-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                  18:5559-5559 (1990)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -C---ADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGFVA 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          13.2%;
                                                                                                                                                                                        to cellulase family C (family 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           36.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 219.5; DB 1
Pred. No. 5.3e-09;
                                                                                                                                                                                                                                                                                                                                                 conversion of cellulose to glucose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches 122; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PSGGN---GGTGTPTSTAPGSGQTSPGGGS
                                                                            as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 1;
                                            http://www.isb-sib.ch/announce/
                                                             Usage
                                                                                                                                                                                                                        cellobiose from the
                                                                                                                                                                                                                                                                                                                                                                                                  gene from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                             à
                                                                                           restrictions
                                                                                                                                                                                        of glycosyl
                                                                                                                                                                                                                                                                                                                                                                                                   Trichoderma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           513;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           89;
                                                                                                                            a collaboration
                                                               for
                                                                                                            outstation
                                                                               H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                        TOIL-
                                                                               g
                                                                                             8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              261
```

```
RESULT
GUN1_TF
  RRRRROCOGGEETTA
                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                        .
A
                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                   먉
                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                문
                                                                                                                                                                                                                                                                                                                                                                                                                                    Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                         P07981;
01-AUG-1988
01-AUG-1988
10-OCT-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
CARBOHYD
DISULFID
DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ACT SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROSITE; F
SEQUENCE FROM N.A. STRAIN=VIT-D-80133; PMEDLINE=87106822; P
                                                                                                                                                                                 TRIRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pfam; PF00840; Glyco_hydro_7; 1.
ProDom; PD001821; CBD fungal; 1.
ProDom; PD186135; Glyco_hydro_7; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      InterPro; IPR000254; CBD fungal.
InterPro; IPR008985; Conh like lec_gl.
InterPro; IPR001722; Glyco_hydro_7.
IPfam; PF00734; CBM_1; 1.
                                           Trichoderma reesei (Hypocrea jecorina).
Bukaryota; Fungi; Ascomycota; Pezizomycotina;
Hypocreomycetidae; Hypocreales; Hypocreaceae;
NCBI_TaxID=51453;
                                                                                                    Bndoglucanase
(Cellulase).
                                                                                                                                                                       GUN1 TRIRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SMART; SM00236;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PIR; S11439; S11439.
HSSP; P00725; BCEL.
                                                                                                                                                                                                                                                                           426
                                                                                                                                                                                                                                                                                                                                              174
                                                                                                                                                                                                                                                                                                                                                                     308
                                                                                                                                                                                                                              486
                                                                                                                                                                                                                                                    272
                                                                                                                                                                                                                                                                                                 227
                                                                                                                                                                                                                                                                                                                       368
                                                                                                                                                                                                                                                                                                                                                                                          128
                                                                                                                                                                                                                                                                                                                                                                                                                267 DRYGGTCDPDGCDWNPYRLGNTSFYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    16
                                                                                                                                                                                                                                                                                                                                                                                                                                     74 SAY--SC----ADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTETSGPVAGKTKV 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           , 38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                              GGIGYIGPTVCASGSTCQVLNPYYSQCL
                                                                                                                                                                                                                                                                                                                       QEKKATSGGMVLVMSL-WD-DYYANMLWLDSTYPTDETSSTPGAVRGSSSTSSGVPAQLE
                                                                                                                                                                                                                                                                                                                                           SRDQCDSFPAPLKPGCQWRFDWFQN---ADNPTFTFQQVQCPABI----VARSGCKRNDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PS00562; CBD_FUNGAL; 1.
                                                                                                                                                                                                                                                     GGIGESGCTTCVSGTTCQKLNDYYSQCL
                                                                                                                                                                                                                                                                            SNSPNAKVVYSNIKFGPIGSTGNPSGGNPPGGNPGTTTPRPATSTGSSPGPTQTHYGQC
                                                                                                                                                                                                                                                                                                   SSFP--
                                                                                                                                                                                                                                                                                                                                                                  VTQFETSGAINRYYVQNGVTFQQPNAELGDYSGNSLDDDYCAAEEAEFGGSSFSDXGGLT
                                                                                                                                                                                                                                                                                                                                                                                         VQSTSTGGDLG----SNQFDIAMPGGGVGIFNGCS-----SQFGGLPGAQYGGIS 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                              PSSNNANTGIG---GHGSCCSEMDIWEAN-SISEALTPHPCTTVGQEICEGDSCGGTYSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPV--YACDANFQRLSDFNVQSGCNGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       degradation;
                                                                                                             (Rel. 08, Created)
(Rel. 08, Last sequence update)
(Rel. 42, Last annotation update)
se EG-1 precursor (EC 3.2.1.4) (En
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18
478
478
229
234
81
287
                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              fCBD;
                                                                                                                                                                                                                                                                                                ----VFTP-----PSGGNGGTGTPTSTAPGSGQTSPGGGSGCTSQKWAQC
  PubMed=2948877;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  513
453
477
513
229
234
62
81
287
502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      13.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hydrolase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 215.5;
Pred. No. le
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N-LINKED (GLCNAC. ..) (POTENTIAL)
N-LINKED (GLCNAC. ..) (POTENTIAL)
N-LINKED (GLCNAC. ..) (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BY SIMILARITY.
BY SIMILARITY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUCLECPHILE (BY SIMILARITY) PROTON DOMOR (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LINKER.
CELLULOSE-BINDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EXOGLUCANASE
                                                                                                                                                                        PRT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       58EF5552717C4C8E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Glycosidase;
                                                                                                                                                                        459
                                                                                                                                                                                                                                                                                                                                                                                                                 -----PGSS---
                                                                                                                                                                                                                                 513
                                                                                                                                                                                                                                                      299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ie-08;
                                                                                                                                                                       Š
                                                                                                                (Endo-1, 4-beta-glucanase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NG (BY SIMILARITY) SIMILARITY).
                                                         Нуростеа
                                                                    Sordariomycetes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Glycoprotein; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                   -FTLDTTK----KLTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 513;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                              485
                                                                                                                                                                                                                                                                                                    271
                                                                                                                                                                                                                                                                                                                                                226
                                                                                                                                                                                                                                                                                                                                                                      367
                                                                                                                                                                                                                                                                                                                                                                                                                   307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      73
```

(POTENTIAL)
(POTENTIAL)

```
PIR; A25928; A
CHAIN
DOWAIN
DOWAIN
DOWAIN
ACT_SITE
ACT_SITE
ACT_SITE
CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              I from Trichoderma reesei at 3.6-A resolution, and a comparison with related enzymes.";
J. Mol. Biol. 272:383-397(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                        This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the SWII outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Kleywegt G.J., Zou J.-Y., Divne C., Davies G.J., Sinning I., Staehlberg J., Reinikainen T., Srisodsuk M., Teeri T.T., Jones T.A.; "The crystal structure of the catalytic core domain of endoglucanase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACTIVE SITE GLU-149.
Tomme P., Clayssens M.;
"Identification of a functionally important carboxyl cellobiohydrolase I from Trichoderma reesei.";
FEBS Lett. 243:239-243(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Cloning, characterization, and expression in Saccharomyces cerevisiae of endoglucanase I from Trichoderma reesei."; interpretable 1987.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Penttilae M., Lehtovaara P., Nevalainen H., Bhikhabhai R., Knowles J.K.C.;
"Homology between cellulase genes of Trichoderma reesei: complete nucleotide sequence of the endoglucanase I gene.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 hydrolases).
-!- SIXILARITY: Contains 1 fungal-type cellulose-binding (CBD) domain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             van Arsdell J.N., Kwok S.,
Gelfand D.H., Innis M.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gene 45:253-263(1986).
                                                                                                                                                                                                PROSITE; PS00562; CBD Cellulose degradation;
                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; M15665; AAA34212.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN=L2
                                                                                                                                                                  SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE=97467423; PubMed=9325098;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -RAY CRYSTALLOGRAPHY (3.6 ANGSTROMS) OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   from the nonreducing end of the cellulose polymer chain; (3)
Beta-1,4-glucosidases which hydrolyze the cellobiose and other
short cello-oligosaccharides to glucose.
CATALYTIC ACTIVITY: Endohydrolysis of 1,4-beta-D-glucosidic
linkages in cellulose, lichenin and cereal beta-D-glucans.
SUBCELLULAR LOCATION: Secreted.
SIMILARITY: Belongs to cellulase family C (family 7 of glycosyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FUNCTION: The biological conversion of cellulose to glucose generally requires three types of hydrolytic enzymes: (1) Endoglucaneses which cut internal beta-1.4-glucosidic bonds; Exocellobiohydrolases that cut the disaccharide cellobiose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FROM N.A.
 1
23
23
398
398
424
424
1149
218
218
223
164
   22
459
397
423
423
149
218
228
223
                                                                                                                                                                                                  Hydrolase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Schweickart V.L., Ladner M.B.,
NUCLEOPHILE.
PROTON DONOR.
N-LINKED (GLCNAC. . . .
N-LINKED (GLCNAC. . . .
                                                                                                       ENDOGLUCANASE |
CATALYTIC:
LINKER.
                                                                                         CELLULOSE - BINDING
                                                                                                                                                                                                  Glycosidase; Glycoprotein; Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23-393
                                                                                                                                             EG-1.
                                                                                         (BY SIMILARITY)
(POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               group
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ñ
   CARBOHYD
CARBOHYD
CARBOHYD
DISULFID
DISULFID
 TURN
TURN
TURN
TURN
STRAND
TURN
STRAND
TURN
STRAND
TURN
STRAND
HELIX
STRAND
HELIX
STRAND
HELIX
STRAND
HELIX
STRAND
HELIX
STRAND
                                                                                                                                                                                                                                                                                                                                                                                                     STRAND
STRAND
STRAND
STRAND
STRAND
STRAND
STRAND
TURN
STRAND
TURN
STRAND
TURN
STRAND
TURN
STRAND
TURN
STRAND
STRAND
STRAND
STRAND
STRAND
TURN
STRAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             \begin{array}{c} \textbf{444030004} \\ \textbf{444040004} \\ \textbf{4540004} \\ \textbf{4540004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{455004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{4550004} \\ \textbf{45500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N-LINKED (GLCNAC.
N-LINKED (GLCNAC.
N-LINKED (GLCNAC.
BY SIMILARITY.
BY SIMILARITY.
```

STETT

Q 멂 S

```
RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                 GUN1_TRILO
Q12714;
                                                                                                                                                                                                                                                                                                                                                                                                                             TRILO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HELIX
TURN
STRAND
TURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                        Perez-Gonzalez J.A.;
Submitted (NOV-1392) to the EMBL/GenBank/DDBJ databases.
-:- FUNCTION: The biological conversion of cellulose to glucose generally requires three types of hydrolytic enzymes: (1)
Endoglucanases which cut internal beta-1,4-glucosidic bonds;
                                                                                                                                                                                                                                                                                                                                                            10-OCT-2003
                                                                                                                                                                                                                                                                                                                                                                        01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                     01-NOV-1997
  This SWISS-PROT
                        hydrolases).
-!- SIMILARITY: Contains I fungal-type cellulose-binding (CBD) domain.
                                                                                           -
                                                                                                                                                                                                                                                                                                                                             Endoglucanase
                                                                                                                                                                                                                          STRAIN=CECT 2606;
                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                               NCBI_TaxID=5548;
                                                                                                                                                                                                                                                                              Eukaryota; Fungi; ]
Hypocreomycetidae;
                                                                                                                                                                                                                                                                                                       Trichoderma longibrachiatum.
                                                     SIMILARITY:
                                                                linkages in cellulose, lichening SUBCELLULAR LOCATION: Secreted.
                                                                                          short cello-oligosaccharides to glucose.
CATALYTIC ACTIVITY: Endohydrolysis of 1,4-beta-D-glucosidic
                                                                                                                   Exocellobiohydrolases that cut the dissaccharide cellobiose from the nonreducing end of the cellulose polymer chair; (3)
Beta-1,4-glucosidases which hydrolyze the cellobiose and other
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SPSCTQTHWGQCGGIGYSGCXTCTSGTTCQYSNDYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DISALPCGENGSLYLSQMDENGGANQYNTAGANYGSGY-CDAQCPVQTWR-NGTL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ASGVTTSGSSLTYNQY----MPSSS-GGYSSVSPRLYLLDSDGZYVMLKLNGQELS-FDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PABIVARSGCKRNDDSSFBVFTBPSGGNGGTGTPTSTA----PGSGQT-----SPGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----NTSHQGFCCNEMDILEGNSRANALTPHSCTATACDSAGCGENPYGSGYKSYYGP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSGCTSQKWAQCGGIGFSGCTTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FGGLPGAQYGGISSRDQCDSFPAPLKPGCQWRFD-WFQNAD--NPTFTFQQVQC-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AGKIMWOST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATSIAGGSESSWCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ASAASGSGQS---TRYWDCCKPSCAWPGKAAVSQPVYACDA-----NFQRLSDFNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PSNILA------NNPNTHVVFSNIRWGDIGS-TTNSTAPPPPPASSTTESTTRRSSTTSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----ASAYGGLATMGKA-----LSSGMVLVFSIWNDNSQYMNWLDSGNAGPCSSTEGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GDTVDTSKTFTEITQFNTDNGSPSGNLVSITRKYQQNGVDIPSAQPGGDT--ISSCPS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          459
                                                                                                                                                                                                                                                                                                                                         (Rel. 35, Created)
(Rel. 35, Last sequence update)
(Rel. 42, Last annotation update)
se EG-1 precursor (EC 3.2.1.4) (Endo-1,4-beta-glucanase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      367
375
378
389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ę,
                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
  entry
                                                    Belongs
                                                                                                                                                                                                                                                                           brachiatum.
Ascomycota; Pezizomycotina; Sordariomycetes;
Archoderma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       373
376
387
391
48208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12.9%;
27.0%;
  Ŗ
                                                     ö
  copyright.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    31;
                                                    cellulase family C
                                                                              lichenin and cereal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 214; DB 1;
Pred. No. 1.2e-08;
                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       D235A256F808CBB9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STGGDLGS-----NQFDI--AMPGGGVGIFNGCSSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
  분
                                                                                                                                                                                                                                                                                                                                                                                                               463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -SGCNGGSAYSCADQTP---WAVNDNLAYGFA
  S
                                                                                                                                                                                                                                                                                                                                                                                                             ð
 produced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    101; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -AC-----
                                                    (family 7 of glycosyl
                                                                              beta-D-glucans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 459;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              459
 through a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -YALTETS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    160;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                           ত
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ġ₽V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    27
                                                                                           GUX1
                                                                                                                                                               S
                                                                                                                                                                                                무
                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                     핝
                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                         먉
                                                                                                                                                                                                                                                                                                                                                                                 á
                                                                                                                                                                                                                                                                                                                                                                                                             맑
                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BBBBBBB
                                                                                                                                              맑
                                                                                                      RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DISULFID
CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DOMAIN
DOMAIN
ACT_SITE
GUX1 HUMGT STANDARD; PRT; 525 AA.
P15878;
01-ARR-1990 (Rel. 14, Created)
01-FEB-1996 (Rel. 33, Last sequence update)
10-OCT-2003 (Rel. 42, Last annotation update)
Exoglucanase I precursor (EC 3.2.1.91) (Exocellobiohydrolase)
beta-cellobiohydrolase) (Beta-glucancellobiohydrolase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACT_SITE
DISULFID
                                                                                           HUMGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ProDom; PD186135
SMART; SM00236;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pfam; PF00734; CBM 1; 1.
Pfam; PF00840; Glyco_hydro_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HSSP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CARBOHYE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Cellulose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A48375; A48375.
                                                                                                                                                                                                403
                                                                                                                                                                                                                                                    348
                                                                                                                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                                                                                 144
                                                                                                                                                                                                                                                                                                                                                         242
                                                                                                                                                                                                                                                                                                                                                                                     120
                                                                                                                                                                                                                                                                                                                                                                                                             184
                                                                                                                                             461
                                                                                                                                                                      297
                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                              201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      P07981; 1BG1
                                                                                                                                                                                                                                                                                                                                                                                                                                        83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                86;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PD186135;
                                                                                                                                             Ç
                                                                                                                                                                      .
13:
                                                                                                                                                                                                PPPPASSTTFSTTRRSSTTS--SSPSCTQTHWGQCGGIGYTGCKTCTSGTTCQYGNDYYS
                                                                                                                                                                                                                                                                                                                               I--AMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDSFPAPLKPGCQWRFD-WFQNAD
                                                                                                                                                                                                                                                                                                                                                         DSAGCGFNPYGSGYPNYFGPGDTVDTSKTFTIITQFNTDNGSPSGNLVSITRKYRQNGVD
                                                                                                                                                                                                                                                                                                                                                                                     PVAG---
                                                                                                                                                                                                                                                                                                                                                                                                             AGANYGSGY-CDAQCPVQTWR-NGTLNTSGQGFCCNEMDILEGNSRANALTPHSCTATAC 241
                                                                                                                                                                                                                                                                                                                                                                                                                                     SGCNGGSAYSCADQTP---WAVNDNL---AYGFAAT--SIAGGSESSWCCACYALTFTSG
                                                                                                                                                                                                                       ---GETETPTSTAPGSGQTSPGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLNDYYS
                                                                                                                                                                                                                                                 YMNWLDSGRAGPCSSTEGNPSNIL--ANNPGTHVVYSNIRWGDIGS---TINSTGGNPPP
                                                                                                                                                                                                                                                                                                       IPSAKPGGDT--ISSCPS-----ASAYGGLATMGKA-----LSSGMVLVFSIWNDNSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                degradation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               23
402
428
218
223
223
435
446
78
164
204
208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                              463
                                                                                                                                                                       299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CAA43059.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22
463
397
427
463
218
218
223
452
204
204
208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    48337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                22;
                                                                                                                                                                                                                                                                            -NPTFTFQQVQCPAEIVARSGCKRNDDSSPPVFTPPSGGN---
```

KIMVV----QSISTGGDLGS----

-NOFD

143

301

239 347 200

460 296 402

ij

(1,4-

101;

Indels

94;

Gaps

18

GUNI

S

댒

8 당 8 멍 S 片 Ś 뫄

당

entities requires a license agreement (See http://www.isb-sib.ch/announce/ or send an email to license@isb-sib.ch). between the Swiss Institute of Bioinformatics and the Ithe European Bioinformatics Institute. There are no rest use by non-profit institutions as long as its content modified and this statement is not removed. Usage by a restrictions and EMBL for commercia. outstation ä 8 g

```
InterPro; IPR000254; CBD fungal.
InterPro; IPR008985; ConA like lec_gl.
InterPro; IPR001722; Glyco_hydro_7.
                                                                                                                                                                                                                                                                                              PS00562; CBD_FUNGAL; 1.
                                                                                                                                                                                                                                                                                                    . ..., ... pydro 7; 1.
135; Glyco_hydro_7; 1.
;; fCBD; 1.
                                                                                                                                                                                                                                                                 Hydrolase; Glycosidase; Glycoprotein; BY SIMILARITY.
                                                           ¥
                                                        Score 203; DB 1;
Pred. No. 7.5e-08;
2; Mismatches 101
                                                                                                                                              CELLULOSE-BINDING (BY SIMILARITY)
NUCLEOPHILE (BY SIMILARITY).
PROTON DONOR (BY SIMILARITY).
BY SIMILARITY.
BY SIMILARITY.
                                                                                                                                                                                                                                     CATALYTIC.
                                                                                                                                                                                                                                                     ENDOGLUCANASE EG-1.
                             Length 463;
                                                           CRC64;
                                                                                     (POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
                                                                         (POTENTIAL)
                                                                                                                                                                                                                                                                                Signal
```

```
Ś
                                                   B
                                                                             Q
                                                                                                          B
                                                                                                                                    Ŋ
                                                                                                                                                                    Matches
                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                   DOMAIN
ACT SITE
ACT SITE
CARBOHYD
                                                                                                                                                                                                                                          DISULFID DISULFID
                                                                                                                                                                                                                                                                                                                                         CHAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                      Pfam; PF00734; CBM 1; 1.
Pfam; PF00840; Glyco hydro 7; 1.
ProDom; PD001821; CBD fungal; 1.
ProDom; PD186135; Glyco hydro 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entities requires a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the European Bioinformatics Institute. There are no restrictions on use by non-profit institutions as long as its content is in no modified and this statement is not removed. Usage by and for commen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Nucleic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=90175006; PubMedade Oliviera Alzevedo M.,
                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                     SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    or send an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CBH-1.
Humicola grisea var. thermoidea.
Eukaryota; Fungi; Ascomycota; mi
NCBI_TaxID=5528;
[1]
                                                                                                                                                                                                                                                                                                                            DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                  PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                             SMART;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HSSP; P00725; 8CEL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PIR; S38794; S38794.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -!- SIMILARITY: Contains 1 fungal-type cellulose-binding (CBD) domain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Sequence of cbh-1 gene of Humicola grisea var. thermoidea.";
Nucleic Acids Res. 18:668-668(1990)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               [nterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         in cellulose and cellotetraose, releasing reducing ends of the chains.
SIMILARITY: Belongs to cellulase family C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Exocellobiohydrolases that cut the dissaccharide cellobiose from the nonreducing end of the cellulose polymer chain; (3) Beta-1,4-glucosidases which hydrolyze the cellobiose and other short cellulopsaccharides to glucose.

CATALYTIC ACTIVITY: Hydrolysis of 1,4-beta-D-glucosidic linkages
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Peic Acids Res. 18:668-668(1990).

FUNCTION: The biological conversion of cellulose to glucose generally requires three types of hydrolytic enzymes: (1) Endoglucanases which cut internal beta-1,4-glucosidic bonds;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hydrolases).
                                                                                                            159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        X17258;
                                                                                                                                        l Similarity
97; Conser
                                                                                                                                                                                                                                                                                                                                                                                                             SM00236;
YSNERYAGYCDPDGCDFNSYRQGNKTFYGKGMTVDTTKKITVVTQFLKDANGDLGEIKRF
                            YALTFISG
                                                     NIEGWTGSTNDPNAGAGRYGTCCSEMDIWEAN-NMATAFTFHPCTIIGQSRCEGDSCGGT
                                                                                                             LNGALYFVSMDADGG--LSRY
                                                                                                                                                                                                                                                                                                                                                                                               PS00562; CBD_FUNGAL; 1
                                                                                NVQSGCN-----GGSAYS--CADQTPWAVNDNLAYGFA--ATSIAGGS--ESSWCCAC 111
                                                                                                                                        LAAALPLVASAASGSGQSTRYWDCCKPSCAWPG-KAAVSQPVYACDANFQRLSDF----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IPR000254; CBD_fungal.
IPR008985; ConA_like_lec_gl.
IPR001722; Glyco_hydro_7.
                                                                                                                                                                                                                                                                                                                                                                                 degradation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  equires a license agreement (See http://www.isb-sib.ch/announce/
email to license@isb-sib.ch).
                                                                                                                                                                                                                           525
                                                                                                                                                                                                                                                      19
468
490
231
236
289
497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CAA35159.1; -.
                                                                                                                                                                                                                           AA,
                                                                                                                                                                                                                                                                                                                                                                                                             fCBD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PubMed=2308855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ascomycota; mitosporic Ascomycota; Humicola
                                                                                                                                                                                                                                          18
525
467
5289
5231
236
236
514
                                                                                                                                                                                  11.2%;
                                                                                                                                                                                                                           55693
                                                                                                                                                                                                                                                                                                                                                                                Hydrolase; Glycosidase; Glycoprotein; Signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Radford A.;
                                                                                                                                                                                                                             Ž
                                                                                                                                                                    33,
                                                                                                                                                                 Pred. No. 1.7e
3; Mismatches
                                                                                                                                                                                Score 185;
Pred. No. 1.
                                                                                                                                                                                                                                       N-LINKED (GLCNAC. . .) (POTENTIAL)
BY SIMILARITY.
BY SIMILARITY.
                                                                                                                                                                                                                                                                               NUCLEOPHILE (BY SIMILARITY).
PROTON DONOR (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                          LINKER.
CELLULOSE-BINDING
                                                                                                                                                                                                                                                                                                                                         CATALYTIC.
                                                                                                                                                                                                                                                                                                                                                     EXOGLUCANASE I.
                                                                                                                                                                                                                           A6684D4CF881E090 CRC64;
                          -PVAGKTMVVQST
                                                                                                                                                                                  DB 1;
.7e-06;
                                                                                                            PGNKAGAKYGTGYCDAQCPRDIKFINGEA
                                                                                                                                                                    136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (family 7 of glycosyi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cellobiose
                                                                                                                                                                                                                                                                                                           (BY SIMILARITY).
                                                                                                                                                                                              Length 525;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        and the EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and other short cello-
                                                                                                                                                                   Indels 124;
                          -STGGDLGS-NQF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a collaboration
                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         non-
                          142
                                                     265
                                                                                                            206
                                                                                                                                        64
```

```
GUX1-PHACH
ID GUX1-DA

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 멓
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   벍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     맑
                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    01-JAN-1990 (Rel. 13, Created)
01-NOV-1995 (Rel. 32, Last sequence update)
10-OCT-2003 (Rel. 42, Last annotation update)
Exoglucanase I precursor (EC 3.2.1.91) (Exocellobiohydrolase
(1,4-beta-cellobiohydrolase).
                                                                                               entities requires a license agreement (See http://www.isb-sib
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Differential expression of multiple exo-cellobiohydrolase I-like genes in the lignin-degrading fungus Phanerochaete chrysosporium." Mol. Microbiol. 12:209-216(1994).

-i- FUNCTION: The biological conversion of cellulose to glucose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=ATCC 34541 / ME446;
MEDLINE=94335641; PubMed=8057846;
Sims P.F.G., Soares-Felipe M.S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           from Phanerochaete chrysosporium that shows strong homo exo-cellobiohydrolase I gene from Trichoderma reesei.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN=ATCC 34541 / ME446;
MEDLINE=89232732; PubMed=3246351;
Sims P.F.G., James C., Broda P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Phanerochaete chrysosporium.

Bukaryota; Fungi; Basidiomycota; Hymenomycetes; Homobasidiomycetes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   P13860;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GUX1_PHACH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PHACH
                                                                or send an email to license@isb-sib.ch)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Aphyllophorales;
NCBI_TaxID=5306;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gene 74:411-422(1988).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              from the nonreducing end of the cellulose polymer chain; (3) Beta-1,4-glucosidases which hydrolyze the cellobiose and other short cello-cligosaccharides to glucose.

CATALYTIC ACTIVITY: Hydrolysis of 1,4-beta-D-glucosidic linkages in cellulose and celloterraose, releasing cellobiose from the non-
                                                                                                                                                                                                                                                                                                                     SIMILARITY: Contains 1 fungal-type cellulose-binding (CBD) domain.
                                                                                                                                                                                                                                                                                                                                                                                      SIMILARITY: Belongs to cellulase family C
                                                                                                                                                                                                                                                                                                                                                                                                                           SUBCELLULAR LOCATION: Secreted.
                                                                                                                                                                                                                                                                                                                                                                                                                                                   reducing ends of the chains.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Exocellobiohydrolases that cut the dissaccharide cellobiose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                generally requires three types of hydrolytic enzymes: (1) Endoglucanases which cut internal beta-1,4-glucosidic bonds;
                                                                                                                                                                                                                                                                                                                                                          hydrolases)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             identification, molecular cloning and characterisation of a gphanerochaete chrysosporium that shows strong homology to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                436 SNVVFSNIRFGPIGSTVAGLPGAGNGGNNGGNPPPPTTTTSSAPATTTTASAGPKAGRWQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               326 YVQDGKIIPNSESTIPGVEGNSITQDWCDRQKVAFGDIDDFNRKGGMKQMGKALAGPMVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              186 KPGCQWRFDWFQNADNPTF---TFQQVQCPAEIVARSGCKRN---DDSSFPV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QCGGIGFSGCTTCVSGTTCQKLNDYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VMSI-----WDDHASNMLWLDSTF-----PVDAAGKPGAERGACPTTSGVPAEVEAEAPN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QCGGIGFTGPTQCEEPYICTKLNDWYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Corticiaceae; Phanerochaete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ---DIAMPG--GGVGIFNGCSSQ---FGGLPG-AQYGGISSRDQCDSFPAPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PSGGNGGTG----TPTSTAPGSGQTSPGGGSGCTSQKWA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Wang
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q., Gent M.E., Tempelaars C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ξ.
                                                                                                                                                                                                                                                                                                                                                                                         (family 7 of glycosyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     chrysosporium.";
                                                                                                  .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ົວ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   185
```

EMBL; M22220; AAB46373.1;

```
RESULT 13
GDX1 PENCY
ID COMMITTEE
ID COMMITT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                Q06886;
01-FEB-1995
01-FEB-1995
10-CCT-2003
                                                                                                                                                                                                                                                    PENJA PENJA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
ACT_SITE
ACT_SITE
CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIGNAL
CHAIN
                                                                                                                    01-FEB-1995 (Rel. 31, Created)
01-FEB-1995 (Rel. 31, Last sequence update)
10-OCT-2003 (Rel. 42, Last annotation update
Exoglucanase I precursor (EC 3.2.1.91) (Exo
(1,4-beta-cellobiohydrolase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pfam; PF00734; CBM 1; 1.

Pfam; PF00840; Glyco hydro 7; 1.

Probom; PD001821; CBD furgal; 1.

Probom; PD186135; Glyco hydro 7; 1.
    Eukaryota; Fungi; Ascomycota; Pezizomyc
Eurotiales; Trichocomaceae; mitosporic
NCBI_TaxID=5079;
[1]
                                         Penicillium janthinellum (Penicillium vitale).
Eukaryota; Fungi; Ascomycota; Pezizomycotina; Eurotiomycetes;
Eurotiales; Trichocomaceae; mitosporic Trichocomaceae; Penici
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       InterPro; IPR000254; CBD fungal.
InterPro; IPR0008985; Conh like lec_gl.
InterPro; IPR001722; Glyco_hydro_7.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HSSP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cellulose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SMART:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JS0083; JS0083.
                                                                                                                                                                                                                                                                                                                                                                                                                                          414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            307
                                                                                                                                                                                                                                                                                                                                                            468
                                                                                                                                                                                                                                                                                                                                                                                                 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             259 DTGLCDADGCDFNSFRMGDQT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          211 SANAGTG---NYGTCCTEMDIWEANNDAAAYTP-HPCTT-----NAQTRCSGSDCTR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          P00725; 2CBH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Z22528; CAA80253.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SM00236; fCBD; 1.
PS00562; CBD FUNGAL; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20 SAASGSGQSTRYWDCCKPSCAWPGK--AAVSQPVYACDANFQRLSDFNVQSGCNGG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                        SSSSTPETQPTGVTVPQWGQCGGIGYTGSTTCASPYTCHVLNPYYSQC 515
                                                                                                                                                                                                                                                                                                                                                                                    GSGQTSFGGGSGCTSCKWAQCGGIGFSGCTTCVSGITCQKLNDYYSQC 298
                                                                                                                                                                                                                                                                                                                                                                                                                                          TTSGVPAQIEAQS-----PNAYVVFSNIKFGDLNTTYTGTVSSSSVSSSHSSTSTSSSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GGLKQVGEALRTGMVLALSIWDDYAANML-----WLDSMYPTNKDPSTPGVARGTCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGISSRDQC----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AGTLTEIRRLYVQN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AG----KTMVVQSTSTGGDLGSNQEDIAMPG-GGVGIF--NGCSSQ---FGGLP-GAQY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              degradation; Hydrolase; Glycosidase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     450
481
225
230
208
208
326
442
488
499
30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PAEIVARSGCKRNDDSSFPVFTPPSGGNGGT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AA;
                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     480
516
225
230
208
208
326
442
505
515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11.1%;
24.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 54857 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -SAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFISGPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -GKVIQNS-SVKIPGIDPVNSITDNFCSQQKTAFGDTNYFAQH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             37; Mismatches 113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BY SIMILARITY.
BY SIMILARITY.
RS -> EN (IN REF. 1).
PA -> RT (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 184; DB 1
Pred. No. 2e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-LINKED (GLCNAC. ..) (POTENTIAL)
N-LINKED (GLCNAC. ..) (POTENTIAL)
N-LINKED (GLCNAC. ..) (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PROTON DONOR (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EXOGLUCANASE I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NUCLEOPHILE (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CELLULOSE-BINDING (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -DSFPAPLKPGCQWREDWFQ-----NADNPTFTFQQVQC-
                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1C7C3D338ECE1B72 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          537 AA
                                                                                                                                                 update)
) (Exocellobiohydrolase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 1; Length 516;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Glycoprotein; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels 112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (POTENTIAL)
                                               Penicillium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ---GTPTSTAP 250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               258
                                                                                                                                                                                                                                                                                                                                                                                                                                              467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                        밁
                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                           뮍
                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                Ś
        무
                                         Ś
                                                                                        밁
                                                                                                                               Ş
```

```
SARAR REPRESENTATION OF THE PROPERTY OF THE PR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         InterPro; IPR008985; ConA like lec gl
InterPro; IPR001722; Glyco hydro 7.
Pfam; PF00734; CBM 1, 1.
Pfam; PF00840; Glyco hydro 7; 1.
ProDom; PD001821; CBD fungal; 1.
ProDom; PD0186135; Glyco hydro 7; 1.
ProDom; PD186135; Glyco hydro 7; 1.
SYART; SW00236; FCBD; 1.
SYART; SW00236; FCBD; FUNGAL; 1.
PROSITE; PS00562; CBD FUNGAL; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CARBOHYD
CARBOHYD
CARBOHYD
DISULFID
DISULFID
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ACT SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -!- CATALYTIC ACTIVITY: Hydrolysis of 1,4-beta-D-glucosidic linkages in cellulose and cellotetracse, releasing cellobiose from the non-reducing ends of the chains.
-!- SUBCELLULAR LOCATION: Secreted.
-!- SUBCELLULAR LOCATION: Secreted.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gene 124:57-65(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Cloning, sequencing, and heterologous expression of a cellulase-encoding cDNA (cbh1) from Penicillium janthinellum.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
STRAIN=C41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=93178976; PubMed=8440481;
Koch A., Weigel C.T.O., Schulz G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Cellulose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PIR; JU0150; JU0150.
HSSP; P00725; 8CEL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; X59054; CAA41780.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -!- SIMILARITY: Contains 1 fungal-type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              InterPro; IPR000254; CBD fungal.
InterPro; IPR008985; ConA_like_lec_gl.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         hydrolases)
                                                                                                                                                                                                          363
                                                                                                                                                                                                                                                          117 TSGPVAGKTMVVQSTSTGGDLGSNQFDI--AMPGGGVGIFNGC--
                                                                                                                                                                                                                                                                                                             309 FTVVTQFLTNDGTSTGTLSEIKRFYVQGGKVIGNPQSTIVGVSGNSITDSWCNA-
                                                                                                                                                                                                                                                                                                                                                                                                                   268 GTYSTDRYGGTCDPD------GCDFNPYRWGVTNFY-----GPGETIDTKSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     24
                                                                                                                                                                                                                                                                                                                                                                   84 WAV----NDNLAYGFAA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
NAYVIYSNIKTGPLNS--TETGGTTSSSSTTTTTSKSTSTSSSSKTTTTVTTTTTSSGSS
                                                     AEIVARSGCKRNDDSSFPVFTPPSGGNGGTGTPTSTAPGSGQ------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSGQSTRYWDCCXPSCAWPGKAAVSQPVYACDANFQRLSDFNVQSGCNGGSAYSCADQTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         degradation; Hydrolase; Glycosidase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              13 453
19 453
19 477
78 537
15 235
0 136
414
456
526
536
536
56842 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                     -SSQFGGLPGAQYGGISSRDQCDSFPAPLXPGCQWRFDWFQNADNPTFTFQQYQCP
                                                                                                                                                                                                          ---QKSAFGD--TNEFSKHGGMAGMGAGLADGMVLVMSLMDDHASDMLWL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11.0%;
23.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 183; DB 1;
Pred. No. 2.5e-06;
0; Mismatches 99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N-LINKED (GLCNAC. ..)
N-LINKED (GLCNAC. ..)
N-LINKED (GLCNAC. ..)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BY SIMILARITY.
BY SIMILARITY.
, A6B9C6EB73F17FE4 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NUCLEOPHILE (BY SI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PROTON DONOR (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LINKER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CATALYTIC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EXOGLUCANASE I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      POTENTIAL
                                                                                                                                                                                                                                                                                                                                                                   -----TSIAGGS-ESSWCCACYALTE 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cellulose-binding (CBD)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Glycoprotein; Signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels 130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (POTENTIAL)
                                                          -TSPGGGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    domain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                             441
                                                                                                                                                                  212
                                                                                                                                                                                                                  407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           83
                499
                                                                261
                                                                                                                                                                                                                                                                  157
                                                                                                                                                                                                                                                                                                                        362
                                                                                                                                                                                                                                                                                                                                                                                                                           308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14;
```

```
RESULT 14
GUX1_NEUCR
ID GUX1_N
AC P38676
                                                                                           문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ŕ
              Ś
                                       Query Match
Best Local S
Matches 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-FEB-1995
01-FEB-1995
10-OCT-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gene 161:137-138(1995).
-!- CATALYTIC ACTIVITY: Hydrolysis of 1,4-beta-D-glucosidic linkages in cellulose and cellotetraose, releasing cellobiose from the non-reducing ends of the chains.
-!- SUBCELLULAR LOCATION: Secreted.
-!- SIMILARITY: Belongs to cellulase family C (family 7 of glycosyl
                                                                                                                                    ACT_SITE
                                                                                                                                                                          DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                        entities requires a license agreement (See http:\bar{l}/www-isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                 use by non-profit institutions as long as its content modified and this statement is not removed. Usage by an
                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Taleb F., Radford A.;
The cellulase complex of Neurospora crassa: cbh-1 cloning,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Eukaryota; Fungi; Ascomycota; Pezizomycotina; Sordariomycetes;
Sordariomycetidae; Sordariales; Sordariaceae; Neurospora.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Exoglucanase 1 precursor (EC 3.2.1.91) (Exocellobiohydrolase 1) (1,4-beta-cellobiohydrolase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           P38676;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GUX1_NEUCR
                                                                                             SEQUENCE
                                                                                                                                                                                                     CHAIN

    -:- SIMILARITY: Contains 1 fungal-type cellulose-binding (CBD) domain.

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sequencing and homologies.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=74-OR23-1A /
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neurospora crassa.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CBH-1
                                                                                                         DISULFID
                                                                                                                                                              DOMAIN
                                                                                                                                                                                                                   SIGNAL
                                                                                                                                                                                                                                             SMART;
                                                                                                                                                                                                                                                      PFam, PF00734; CBM 1; 1.
Pfam, PF00540; GlyGo hydro 7; 1.
ProDom, PD001821; CBD fungal; 1.
ProDom, PD186135; GlyGo hydro 7; 1.
                                                                                                                                                                                                                                                                                                         InterPro; IPR000254; CBD_fungal.
InterPro; IPR008985; ConA_like_lec_gl.
InterPro; IPR001722; Glyco_hydro_7.
                                                                                                                                                                                                                                                                                                                                                      HSSP; P00725; 8CEL.
                                                                                                                                                                                                                                                                                                                                                                   PIR; S42093; S42093.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=95369725;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=5141;
                                                                                                                       DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    262
               22
                                                                                                                                                                                                                                                                                                                                                                              X77778;
                                        l Similarity
81; Conser
                                                                                                                                                                                                                                             SM00236; fCBD; 1
ASGSGQSTRYWDCCKPSCAW-PGKAAVSQPVYACDANFQRLSDENVQSGCNGGSAYS---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTGARDWAQCGGNGWTGPTTCVSPYTCTKQNDWYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCTSQXWAQCGGIGESGCTTCVSGTTCQKLNDYYSQCL
                                                                                                                                                                                                                              degradation; Hydrolase; Glycosidase; Glycoprotein; Signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (Rel. 31, Last sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (Rel
                                                                                                                                   446
481
223
228
                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                              CAA54815.1; -.
                                                                                             A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PubMed=7642129;
                                                                                                         4445
516
223
228
515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FGSC 987;
                                                    10.9%;
                                                                                              54471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Created)
                                                                                              ¥,
                                        43;
                                       Score 181; DB 1;
Pred. No. 3.4e-06;
3; Mismatches 129
                                                                                                                                          LINKER.
CELLULOSE-BINDING (BY SIMILARITY).
NTCLEOPHILE (BY SIMILARITY).
                                                                                                         BY SIMILARITY.
                                                                                                                                   NUCLEOPHILE (BY SIMILARITY).
PROTON DONOR (BY SIMILARITY).
                                                                                                                                                                                        EXOGLUCANASE 1. CATALYTIC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                              38E598406EA81900 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          516 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    299
                                                                  Length 516;
                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                       and for
                                           78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ij
                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                    no
```

```
RESULT 15
CEL1_AGABI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           묽
   맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             뮹
InterPro; IPR000254; CBD_fungal.
InterPro; IPR005103; Glyco_hydro_61.
Pfam; PF00734; BP ; 1.
Pfam; PF03443; Glyco_hydro_61; 1.
SMART; SM00236; fCBD; 1.
                                                                                                                                                                                                                                                                                                      Armesilla A.L., Thurston C.F., Yaguee E.;
"CELI: a novel cellulose binding protein secreted by Agaricus bisporus during growth on crystalline cellulose.";
FENS Microbiol. Lett. 116:293-299(1994).
-I- FUNCTION: PROBABLE GLYCOSYL HYDROLASE ACTIVE ON CELLULOSE.
-I- SUBCELLULAR LOCATION: Secreted.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-NOV-1997 (Rel. 35, Last sequence update)
10-0CT-2003 (Rel. 42, Last annotation update)
Cellulose-growth-specific protein precursor.
                                                                                                                                              modified and this statement is not removed. entities requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                                             the European Bioinformatics Institute. The use by non-profit institutions as long
                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EN the European Bioinformatics Institute. There are no restitute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Agaricus bisporus (Common mushroom).
Eukaryota; Fungi; Basidiomycota; Hymenomycetes; Homobasidiomycetes;
Agaricales; Agaricaceae; Agaricus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     200023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CEL1_AGABI
                                                                               PIR; JC1311; JC1311.
HSSP; P00725; 2CBH.
                                                                                                              EMBL; M86356; AAA53434.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=D649;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gene 119:183-190(1992)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      from Agaricus bisporus.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=93012985; PubMed=1398098;
Raguz S., Yaguee E., Wood D.A., Thurston C.F.;
*Isolation and characterization of a cellulose-growth-specific gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=5341;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                        WEDLINE=94237428; PubMed=8181702;
                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                         |- SIMILARITY: Contains 1 fungal-type cellulose-binding (CBD)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TRAIN-D649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            211 ANGIGD---HGSCCSEMDIWEANKVSTAFTPHPCTTIEQHMCE-----GDSCGGTYSDDR 262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AQCGGIGFSGPTTCPEPYTCAKDHDIYSQCV 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACCGGIGESGCITCVSGTTCQKLNDYYSQCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KRNDDSSFPV----FTPPSGGNGGT-----GTPT-STAPGSGQTSPGGGSGCTSQKW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QN---GKVIENSQSNVDGVSGNSITQSFCKSQKTAFGDIDDFNKKGGLKQMGKALAQAMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YGVLCDADGCDFNSYRMGNTTFYGEGKTV---DTSSKFTVVTQFIKDSAGDLAEIKAFYV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SKVAFSNIKFGHLGISÞFSGGSSGTÞPSNÞSSSASÞTSSTAKÞSSTSTASNÞSGTGAAHW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LVMSIWDDHAANMLWLDSTYPVPKVPGA-----YRGSGPTTS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQ---FGGLPG-AQYGGISSRDQC-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (Rel. 35,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -C----ADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAG-KTMVV 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----DSFPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPABIVARSGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     320
                                                                                                                                                               (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ₹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  299
                                                                                                                                                                                               36
                                                                                                                                                                                Usage
                                                                                                                                                                                                 its content
                                                                                                                                                                                 by and
                                                                                                                                                                                                                restrictions
                                                                                                                                                                                                                                  gh a collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -GVPAEVDANAPN
                                                                                                                                                                                 for commercial
                                                                                                                                                                                                                                                                                                 domain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   376
```

85 55	8 8	9d VQ	B, 8	용 성	정	Ma.	8 4 4 4 4 4 4 4 8 8 8 8 8 8 8 8 8 8 8 8
257 279	217 219	159 172	123 123	64 71	10 15	Query Match Best Local Similarity Matches 85; Conser	PROSITE; Cellulose SIGNAL CHAIN DOMAIN DOMAIN DOMAIN DOMAIN DISULFID DISULFID CARBOHYD SEQUENCE
PGGGSGCTSQKWAQ	ARSGCKRND;	SQFGGLPGAQYGGI ; STVPSGAYMIF	GKTMVVQSTST	FWVQS-GCNGGSAY : ATASTVGCNN	TLAAALPLVASAAS : : TFSLALGLFAAKVÇ	vat	PROSITE; PS00562; CBD_FUNGAL; 1. Celiulose degradation; Hydrolase SIGNAL 1 29 POT CHAIN 30 320 CBI DOWAIN 30 261 LIN DOWAIN 262 285 LIN DOWAIN 286 320 CBI DISULFID 292 309 BY DISULFID 303 319 BY CARBOHYD 163 163 3754 MW; 6
PGGGGCTSQKMAQCGGIGFSGCTTCVSGTTCQKLAUYYSQCL 	ARSGCKRND	SQFGGLPGAQYGGISSRDQCDSFPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPAEIV	GKTMVVQSTSTGGDLGSNOFDIAMPGG	SCA	TLAAALPLVASAASGSGQSTRY-WDCCXDSCAWPGKAAVSQPVYACDANEQRLSD :	8*; 36	D_FUNGAL; 1. n; Hydrolase; Glycopidein; Signal n; Hydrolase; Glycopidein; Signal n; Hydrolase; Glycopidein; Signal n; CELLULOSE-GROWTH-SPECIFIC PROTEIN. 61 CATALYTIC (POTENTIAL). 85 LINKER (POTENTIAL). 109 EXIMILARITY. 109 BY SIMILARITY. 119 BY SIMILARITY. 133754 MW; 60E2C8080895CA2B CRC64;
SSAKUTNDAKS 	DSSFPVFTPPSGGNGG ::: EAMIDTTYIVPGPPLYGSGGNGGSP	PGCQWRFDWFQNA PECA	KGVWGSGKMIDQN	DOCEWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVA	KPSCAWPGK : YEGWHPYNTPVGQ	B 1; e-06; 132;	1. 1. 2. Glycosidase; Glycoproteir porential. CELLULOSE-GROWTH-SPECIFIC PROTEATAL). LINKER (POTENTIAL). CELLULOSE-BINDING (POTENTIAL). BY SIMILARITY. N-LINKED (GLCNAC) (POTENTIAL). 60E2C8C80895CA2B CRC64;
CL 299 CL 320	GGTGTPTSTAPGSGQTS	DNPTETFQQVQCPAEIV	SNQFDIAMPGGGVGIFNGCS : : DQNNSWTTTIP	ESSWCCACYALTE : NQVWPHPYGPMTT	AAVSQPVYACDAN ::: TSIERPWAJ	Length 320; Indels 90;	11ycoprotein; Si PECIFIC PROTEIN. AL). (SOTENTIAL). (SOTENTIAL). CRC64;
	OGSGQTS 256	AEIV 216 : : PTSSELV 218	31FNGCS 158	TSGPVA 122 TYLGKCP 122	WFQRLSD 63	Gaps 1	igmal.
	æ 55	<u>Б</u> Б	7 58	22 22		15;	

Search completed: July 7, 2004, 08:53:23 Job time: 19 secs

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 s:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Minimum DB seq length: 0
Maximum DB seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Database :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            or:
    111111098765432
654311098765432
                                                                                                                                                                                                                                       Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
  117c
1039
757.5
756.5
726.5
745
724
724
709
706.5
703
706.5
698.5
698.5
                                                                                                                                                                                     Score
                                                                                                                                                                                                                                                                                                                                                                                                                                   SPTREMBL 25:*
1: sp_archea:*
2: sp_bacteria
3: sp_fungi:*
                                                                                                                                                                                   Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   July 7, 2004, 08:47:55; Search time 45 Seconds (without alignments) 2096.443 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-10-007-521-12
1659
                                                                                                                                                                                                                                                                                                                                                                       9 2 3 5 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 MRSTPVLRTTLAAALPLVAS.....TTCVSGTTCQKLNDYYSQCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1017041 seqs, 315518202 residues
  44444444444557677644557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Copyright
                                                                                                                                                                                                                                                                                                                                                        sp_organelle:*
sp_phage:*
sp_plant:*
                                                                                                                                                                                                                                                                                                                                                                                                                          sp_archea:*
sp_bacteria:*
sp_fungi:*
sp_human:*
                                                                                                                                                                                                                                                                               sp_rodent:*
sp_virus:*
sp_vertebrate:*
sp_unclassified:*
sp_arctriap:*
sp_bacteriap:*
sp_archeap:*
                                                                                                                                                                                                                                                                                                                                                                                        sp_mammal:*
sp_mbc:*
                                                                                                                                                                                                                                                                                                                                                                                                               sp_invertebrate:*
                                                                                                                                                                                    Length
  GenCore version 5.1.6 (c) 1993 - 2004 Compugen Ltd.
                                                                                                                                                                                     B
                         097201
093782
0800K8
0801L0
0801L1
0801L1
0801L1
090H81
1 090H81
1 090H81
1 090H81
1 090H81
1 090H83
                                                                                                                                                                                   ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        summaries
                                                                                                                                                                                                                    SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1017041
0872q1 neurospora
09378 humicola gr
08308 melanocarpu
085110 rhizopus or
085111 rhizopus or
085111 rhizopus or
085111 rhizopus or
095192 unclassifie
095193 unclassifie
095195 unclassifie
095195 unclassifie
095196 unclassifie
                                                                                                                                                                                  Description
  Query Match
```

3	RAP DR RA	# # # # # R R O O O O S	288888	RES Q87		
Ž	SEQUENT SEQUENT SUBMIT: EMBL; EMBL; EMBL; EMBL; Interp Interp Interp Interp Probom SMART; PROBOM SMART; PROSIT: PROSIT	Neuros Eukarys Sordar Sordar NCBI T. [1] SEQUEN Schulte Nyakatt Nyakatt Submitt	HYD 0111	SULT 1	4444410 44444460 4444460 4444460 444460 44460 44460 44460 4600 460	,
at Ch	CE I PPO	Neutrospora crassa Bukaryota; Fungi; Sordariomycetidae NCBI_TaxID=5141; [1] TaxID=5141; [1] ROM N.A SEQUENCE FROM N.A Schulte U., Aign Nyakatura G., Mew Nyakatura G., Mew Nyakatura (MAR-20)	01-JUN-2003 (01-JUN-2003 (01-JUN-2003 (01-OCT-2003 (Hypothetical	201	697 699 699 689.5 689.5 680.5 617.5 617.5 617.5 617.5 543.5 543.5 340.5 334.5 338.5 36.5 36.5 36.5 36.5 36.5 36.5 36.5 36	9
	FROM N.A. (WAR-2003) (WAR-2003) (WAR-2003) (WAR-2003) (S576; C:ext: 08810; F:cell 08910; F:cell 1090099; 11PR0000344; 11PR000344; 10PR000344; 10PR000344; 10PR000346; 10PR000	mssa. idae; 41; N.A. I N.A. ign v Mewe R-200	(TrEMBLrel (TrEMBLrel (TrEMBLrel, (TremBLrel,	PRELIMINARY	11111111111111111111111111111111111111	
76 .	genome p Joseph State D70529 1 extracel extracel extracel graphy graphy	orda Hob	rel. 24 rel. 24 rel. 25 rel. 25	VARY;	2219 2220 2220 2119 2119 2119 2110 2220 222	?
7.	me proj c the E 29.1; 29.1; acellul ulase a chydrat achydrat achydrat achydrat proj lyco hy lyco hy lyco y ydro 45 fungal; i crungal; crungal;	rcota; rriale reisel , Man			ユエユエト 50 50 50 50 50 50 50 50 50 50 50 50 50	
E45; 1. D96407E349877A CRC64	GenBank/DDBJ databas IEA. ity; IEA. itabolism; IEA. _45. _95.	Pezizomycotina; s; Sordariaceae; J., Brandt P., F nhaupt G.; MBL/GenBank/DDBU	Created) Last sequence update) Last annotation update) 010.	PRT, 293 AA.	09JH88 09JH89 09JH89 09JH93 09JH93 09JH85 09JH85 QYYZIT8 QYYZIT7 QYYZIT7 QYYZIT7 QYYZIT7 QYYZIT9 09JH815 09JH81 09JH81 09JH82 09JH82 09JH82 09JH82 09JH82 09JH832 09JH832 09JH832 09JH8332	20 702
-h 293.	o.	Sordariomycetes; Neurospora. artmann B., Holland R.,			Q9jh88 unclassifie Q9jh96 unclassifie Q9jh96 unclassifie Q9jh93 unclassifie Q9jh87 unclassifie Q9jh85 unclassifie Q9jh85 mastotermes Q9p868 piromyces e Q7yzt8 mastotermes Q7yzt9 mastotermes Q7yzt9 mastotermes Q9uvp3 alternaria Q8i815 apriona ger Q9yh94 unclassifie Q9jh96 unclassifie Q9jh98 unclassifie Q9jh97 unclassifie	יייייייייייייייייייייייייייייייייייייי

76.7%;

Score 1272;

DB 3;

Length 293;

178

```
NESULT 2
O9378
ID O937
ID O937
AC O937
Ś
                                         문
                                                                                                         ő
                                                                                                                                                                       밁
                                                                                                                                                                                                             Ŋ
                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              093782;
093782;
01-MAY-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GO; GO:0005576; C:extracellular; IEA.
GO; GO:0008810; F:cellulase activity; IEA.
GO; GO:0005975; P:carbohydrate metabolism; IEA.
InterPro; IPR009009; Barwin like.
InterPro; IPR000254; CBD fungal.
InterPro; IPR000334; Glyco_hydro_45.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Takashima S., Iikura H., Nakamura A., Hidaka M., Masaki H., Uozumi 1 "Comparison of gene structures and enzymatic properties between two endoglicanases from Humicola grisea.";
J. Biotechnol. 67:85-97(1999).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pfam; PP00734; CBM 1; 1.
Pfam; PP02015; GlyGo hydro_45; 1.
ProlDom; PD001382; CBD fungal; 1.
SMART; SM00236; FCBD; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; AB003107; BAA74956.1; -. HSSP; P43316; ZENG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bukaryota; Fungi
NCBI_TaxID=5528;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-MAY-1999
01-OCT-2003
                                                                                                                                                                                                                                                                                                                                                                                                                        PROSITE; PS00562; CBD_FUNGAL; 1.
PROSITE; PS01140; GLYCOSYL_HYDROL_F45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Humicola grisea var. thermoidea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Endoglucanase.
                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=99144540; PubMed=9990729;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                  Local 208;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121 VAGKTIXVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLFGAQYGGISSRDQCDS 180
        120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61 LSDASVKSGCDGGSAYTCANNSPWAVNDQLSYGFAATKLSGGTESSWCCACYALTFTSGP ::20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                             មុខ
                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAMPGKAAVSQPVVACDANPQR
                                                                                                                                                                       -4
                                                                                                                                                                                                                            ۲
                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VAGKTLVVQSTSTGGDLGSNHFDINMPGGGVGLFDGCKRQFGGLPGAQYGGISSRSQCDS 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LSDFNVQSGCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTGTPTSTAPGSGQTSPGGGSGCTSQKWAQCGGTGFSGCTTCVSGTTCQKLNDYYSQC 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MRSSTILQTGLVAALPFAVQAASGSGQSTRYWDCCKPSCSWSGKAPVNRPVLACDANNNP 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NPSTPT
     PVAGKTMVVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCD 179
                                                       LSDFNVQSGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSG
                                                                                                                                                                       MRSSPILLPSDVVAALLPVLALAA--DGKSTRYWDCCKPSCGWAKKAPVNQPVFSCNANFQR
                                                                                                                                                                                                                         MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANEQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FPAALKPGCQWRFDWFQNADNPNFTFKQVQCPSELTSRTGCKRNDDSQFPVFTPPSGGGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FPAPLKPGCOWREDWFQNAINWFTFTFQQVQCPABIVARSGCKRNDDSSFFVFTFPBSGGNG 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9 (TrEMBLrel. 10,
9 (TrEMBLrel. 10,
3 (TrEMBLrel. 25,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Fungi; Ascomycota; mitosporic Ascomycota; Humicola
                                                                                                                                                                                                                                                                                                                                                                                                305 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                32174 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  74.8%;
                                                                                                                                                                                                                                                                                 70.5%; Score 1170; I
67.8%; Pred. No. 2.1e
Live 44; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -GGGSGCTADKYAQCGGSGWSGCTNCPSGSTCKTINDYYHQC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Last sequence update;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pred. No. 1.5e-93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT;
                                                                                                                                                                                                                                                                                                                                                                                                28C979D6EDCD771D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            305
                                                                                                                                                                                                                                                                                                              2.1e-85;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                        DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           39;
                                                                                                                                                                                                                                                                                       45,
                                                                                                                                                                                                                                                                                                                                      Length 305;
                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                       10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      292
                                                             118
                                                                                                                                                                          58
                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                               119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 3

QRADKS

QRADKS

ID QRAD

AC QRAD

DT 01-W

DT 01-W

DT 01-W

CGLI

GN CELI

GN CELI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
     RESULT
Q8J1L0
                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                              븅
                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                        몱
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     믕
                                                                                                                                                                    ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                     유
                                                                                                                                                                                                                               뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local S
Matches 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; AJS15703; CAD56665.1;
GO; GO:0008810; F:cellulase activity; IRA.
GO; GO:0016798; F:chydrolase activity, acting
GO; GO:0016798; P:carbobydrate metabolism; IE
InterPro; IPR009099; Barwin like
InterPro; IPR009099; Barwin like
InterPro; IPR00334; Glyco-hydro 45.
Pfam; PF02015; Glyco-hydro 45; I.
PR0517E; PS01140; GLYCOSYL HYDROL F45; I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     О8ЛОКВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-MAR-2003 (TrEMBLrel.
01-MAR-2003 (TrEMBLrel.
01-OCT-2003 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Haakana H., Miettinen-Oinonen B., Joutsjoki V., Mantyla A., Suominen P., Vehmaanpera J.; "Cellulase Genes from Melanocarpus albomyces: Cloning and H Expression in Trichoderma reesei."; Expression in Colonomyces: Cloning and H Expression in Trichoderma ressei."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Cellulase precursor (EC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             овлокв;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Eukaryota; Fungi; Ascomycota; Pezizomycotina; Sordariomycetes;
Sordariomycetidae; Sordariales; Sordariales incertae sedis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Signal; Hydrolase; Glycosidase.
SIGNAL ; 21 PO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Melanocarpus albomyces.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=204285;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180 SFPAPLKPGCQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKRNDDSSFP-VFTPBSGG 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        119 PVAGKKMVVQSTSTGGDLGSNHFDLNIPGGGVGIFDGCTPQFGGLPGQRYGGISSRNECD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               299
                                                                                                                     179
                                                                                                                                                                       181
                                                                                                                                                                                                                               119
                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                              59
                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           μ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                              VAGKTMVVQSTSTGGDLGSNQFDIAMÞGGGVGIFNGCSSQFGGLÞGAQYGGISSRDQCDS 180
                                                                                                                                                                                                                                                                                                                                                                                          LSDENVOSGCNGGSAYSCADQTEWAVNDNLAYGSAATSIAGSSESSWCCACYALTETSGP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MRSTPVLRTTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DWYHQCL 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DYYSOCL 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SSPVGQPTSTSTTSTTSSPPVQPTTPSGCTAERWAQCGGNGWSGCTTCVAGSTCTKIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NGGTGTPTSTAPGSGQTS-----PGGGSGCTSQXWAAQCGGTGFSGCTTCVSGTTCQXLN 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REPDALKPGCYWREDWEKNADNESESERQVQCEAELVARTGCRRNDDGNEFAVQIESSST 238
                                                                                                                                                                 FPAPLKEGCOMREDWEGNADNETETEGQVQCPAEIVARSGCKRNDDSSFEVETEPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                           WRSTPVLRALLAAALPIGALAA--NGQSTRYWDCCKPSCGWRGKGPVNQPVYSCDANFQR 58
                                                                                                                                                                                                                               VAGKTMVVQSTSTGGDLGSNHFDLNIPGGGVGLFDGCTPQFGGLPGARYGGISSRQECDS
                                                                                                                                                                                                                                                                                                                                              IHDFDAVSGCEGGPAFSCADHSPWAINDNLSYGFAATALSGQTEESWCCACYALTFTSGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  235 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25001 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62.6<del>1</del>;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23, Created)
23, Last sequence update)
25, Last annotation update)
3.2.1.4).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 1039; DB 3;
Pred. No. 4.2e-75;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CELLULASE.
; BF9850E83666CD76 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acting
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IEA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Cloning and High-level
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           glycosyl bonds;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
```

IE)

2; Gaps

234

118

댨 Ş 밁 Ş В ठ 맑 Ś 맑

```
COUNTY SERVIT 5
CONTY OF THE PROPERTY SERVIT SERVIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOR BERRESSEE STREET ST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          먉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; AB056668; BAC53988.1; --
GO; GO:0005576; C:extracellular; IEA.
GO; GO:0005810; F:cellulase activity; IEA.
GO; GO:0008810; P:carbobydrate metabolism;
InterPro; IPR00909; Barwin like.
InterPro; IPR000254; CBD fungal.
InterPro; IPR000334; GBJgoo_hydro_45.
Dfam. DE00734. CMJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-MAR-2003 (TrEMBLrel.
01-MAR-2003 (TrEMBLrel.
01-OCT-2003 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pfam; PF00734; CBM 1; 2.
Pfam; PF02015; GlyCo hydro 45; 1.
ProDom; PD001821; CBD fungal; 2.
SMART; SM00236; fCBD; 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Cloning of new endo-glucanases rce2 and rce3 from Rhizopus oryzae. "; Submitted (MAR-2001) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QBJIL2;
QBJIL2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-FERM BP-6889;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rhizopus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Fungi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RCE3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Endo-glucarase RCE3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=64495;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Rhizopus oryzae (Rhizopus delemar)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q8JIL0;
                                        Murashima K.;
"Cloning of new endo-beta-1,4-D-glucanase, RCE1 from Rhizopus oryzae CP96001.";
                                                                                                                                                                                                                                                                                                                                            Rhizopus oryzae (Rhizopus del
Eukaryota; Fungi; Zygomycota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-MAR-2003 (TrEMBLrel. 23, 01-MAR-2003 (TrEMBLrel. 23, 01-OCT-2003 (TrEMBLrel. 25, Endo-beta-1,4-D-glucanase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROSITE;
        Submitted (AUG-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                      RCE1.
                                                                                                                                                          STRAIN=FERM BP-6889;
                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                           NCBI_TaxID=64495;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  152 IVSGGASGNGVTTRYWDCCKASCSWPGKANVSSPVKSCNKJGWEALSDSNVQSGCNGGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PS00562; CBD_FUNGAL; 2.
PS01140; GLYCOSYL_HYDROL_F45; 1.
366 AA; 38036 MW; 8AZ2B01EF6386374 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CKWRENWEKNADNESMTYKEVTCPKEITAKTGCSR 365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COWREDWEQNADNPTFTEQQVQCPAEIVARSGCKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DLGSSTGAHFDLQMPGGGVGIFNGCSKQWGA-PNDGWGSRYGGISSASDCSSLPSALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DLGSN---QEDIAMPGGGYGIFNGCSSQEGGLP----GAQYGGISSRDQCDSFPAPLKPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YMCNDNQPWAVNDNLAYGFAAAAISGGGESRWCCSCFELTFTSTSVAGKKMVIQVTNTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMVVQSTSTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Zygomycota; Zygomycetes; Mucorales; Mucoraceae;
    to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     45.7%; Score 757.5; DB 3 62.3%; Pred. No. 1.9e-52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23,
23,
25,
                                                                                                                                                                                                                                                                                                                                                                                                 delemar).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Last annotation update
        EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Last sequence update)
Last annotation update/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                             Zygomycetes; Mucorales; Mucoraceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         33B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ž
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IEA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 366;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ψ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4
                                                                                                                                                              RESILLT QUALITY QUALIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       뭉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     븅
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                σ
```

```
Query Match
Best Local S
Matches 135
Query Match
Best Local S
Matches 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                InterPro; IPRO09009; Barwin_like.
InterPro; IPRO09254; CBD_fungal.
InterPro; IPRO09334; Glyco_hydro_45.
Pfam; PF00734; CBW_1; 1.
Pfam; PF00734; CBW_1; 1.
Pfam; PF007015; Glyco_hydro_45; 1.
ProDom; PD001821; CBD_fungal; 1.
SWART; SM00235; CGBJ_1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q8J1L1
Q8J1L1;
Q1-MAR-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; AB047927; BAC53956.1; -.
GO; GO:0005576; C:extracellular; IEA.
GO; GO:0008810; F:cellulase activity; IEA.
GO; GO:0008975; P:carbohydrate metabolism;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROSITE; PS00562; CBD_FUNGAL; 1.
PROSITE; PS01140; GLYCOSYL_HYDRO
SEQUENCE 338 AA; 34748 MW; 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-MAR-2003 (TrEMBLrel.
01-MAR-2003 (TrEMBLrel.
01-OCT-2003 (TrEMBLrel.
                                                              Pfam; PF00734; CBM 1; 1. — Fam; PF02015; Glyco hydro 45; 1. Probom; PD001821; CBD fungal; 1. SMART; SM00236; fCBD; 1. PR051TE; PS00562; CBD FUNGAL; 1. PR051TE; PS00140; GLYCOSYL HYDROL F45; 1. SEQUENCE 360 AA; 37427 MW; F426366260
                                                                                                                                                                                                                                                               EMBL; AB056667; BAC53987.1; -. GO; GO:0005576; C:extracellular; IEA.
                                                                                                                                                                                                                                                                                                  "Cloning of new endo-glucanases rce2 Submitted (MAR-2001) to the EMBI/Gen
                                                                                                                                                                                                                                                                                                                                    Murashima K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Fungi; Zygomycota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rhizopus oryzae (Rhizopus delemar).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Endo-glucanase RCE2
                                                                                                                                                                                                                                                                                                                                                    STRAIN=FERM BP-6889;
                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=64495;
                                                                                                                                                                              InterPro; IPR009009; Barwin_like.
InterPro; IPR000254; CBD_fungal.
InterPro; IPR000334; Glyco_hydro_45.
                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
 hes 128;
                                                                                                                                                                                                                                GO:0008810; F:cellulase activity; IEA. GO:0005975; P:carbohydrate metabolism;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    al Similarity 63.1
135; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18
                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SCADQTFWAVNDNLAYGEAATSIAGGSESSWCCACYALTETSGEVAGKTMVVQSTSTGGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KWRFNWFKNADNESMTYKEVTCPKEITAKTGCSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OWREDWEONADWETFTFOOVOCEAEIVARSGCKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LGSN---QFDIAMPGGGVGIFNGCSSQFGGLP----GAQYGGISSRDQCDSFPAPLKPGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MCNDNQPWAVNDNLAYGFAAAAISGGGESRWCCSCFELTFTSTSVAGKXMVVQVTNTGGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VSGGASGNGVTTRYWDCCKASCSWPGKANVSSPVKSCNKDGVTALSDSNAQSGCNGGNSY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LGSSTGAHFDLQMPGGGVGIFNGCSSQWGA-PNDGWGSRYGGISSASDCSSLPSALQAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY;
 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     45.6%;
63.1%;
                                                                                                                                                                                                                                                                                                  -glucanases rce2 and rce3
to the EMBL/GenBank/DDBJ
   44.9%; Score 745; DI
60.4%; Pred. No. 1.86
:ive 36; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   23,
23,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HYDROL F45; 1.
WW; 961F2AD327C4A9E6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Last sequence update/
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 756.5; DB 3
Pred. No. 2.1e-52;
0; Mismatches 40
                                                                                                                                                                                                                                                                                                                                                                                                                                   Zygomycetes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                   F42636626C58CD64 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
               DB 3;
.8e-51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                     Mucorales;
                                                                                                                                                                                                                                     IEA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       223
                                3; Length 360;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       40;
                                                                                                                                                                                                                                                                                                     from Rhizopus oryzae.";
databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                       Mucoraceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9
      6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         184
      2
```

S ₽,

밁 Ś g δ 밁 8

```
RESULT 8
Q9JH84
ID Q9JH
AC Q9JH
DT 01-0
DT 01-0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QSHBILT QSHBIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
Q9JH84;
Q9JH84;
01-OCT-2000
01-OCT-2000
01-OCT-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ohtoko K., Ohkuma M., Moriya S., Kudo T.;
"Diverse genes of family 45 cellulase homologues of the symbiotic protists in the hindgut of termite Reticulitermes speratus."; Submitted (UUN-2200) to the EMBL/GenBank/DDBJ databases.
EMBL; NB045171; BAA98041.1; -.
BISSP, P43316; 2ENG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ol-OCT-2000 (TEMBLrel. 15, Created)
Ol-OCT-2000 (TEMBLrel. 15, Last sequence update)
Ol-OCT-2000 (TEMBLrel. 25, Last annotation update)
Family 45 cellulase homologue.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GO; GO:0008810; F:cellulase activity; IEA.
GO; GO:0005975; P:carbohydrate metabolism; IEA.
InterFro; IPR009509; Barwin like.
InterFro; IPR009334; Glyco-Fydro-45.
I=fam; PF02015; Glyco-hydro-45; 1.
PROSITE; PS02140; GLYCO-SYL-HYDROL, F45; 1.
PROSITE; PS02140; GLYCO-SYL-HYDROL, F45; 1.
SEQUENCE 219 AA; 23001 NH; 5FZEBBBIA6DE926CE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota.
NCBI_TaxID=42452;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   unclassified eukaryotes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9ЛН92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q9ЛН92
                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                    185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      132;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGFVAGKTMVV 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LVFILALILSVFGDSGRTTRYWDCCKASCAWEKKAAVTQFVDTCGKDGTTRVASNDTVKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYAC--DANFQRLSDFNVQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REGWEKNADNETMIYKQVICEKAITAKSGCSR 359
                                                                                                                                                                                                                                                                                                                             LQAGCQWRFDWFQNADNPSINFNQVTCPGELTAKINCKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QVINTGGDLGSNQFDLAIPGGGVGIINGCTQQ-SGAPADGWGSRYGGVSSRSECSQLPSG 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CNDNQPWVVSDDLAYGFAAASISGSSEAIWCCACFELTFTSTAVKGKXMVVQVINTGSDL
                                                                                                                                                                                                                                                                                                                                                                                             LKPGCÇWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKR 223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACDGGEGYMCYDQAPWAVNDSVAYGFAAAACCGG-ESGACCNCYELTFTSGPVNGKKMVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMVVQSTSTGGDL 137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VSGGASGNGETTRYWDCCKPSCSWPGKADVTSPVGSCNKDGKTLADNNTQNGCVGGSSYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQRLSDFNVQSGCNGGSAYS 77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REDWEQNADNETETEQQVQCEAEIVARSGCKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GSNTGAHEDLQMPGGGVGIYNGCATQWGAPTDGWGARYGGVSSASDCSNLPSALQAGCKW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSN---QFDIAMPGGGVGIFNGCSSQFGGLF---GAQVGGISSRDQCDSFFAFLKFGCQW 191
   O (TrEMBLrel. 15, O) (TrEMBLrel. 15, O) (TremBLrel. 25, O)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        43.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      26;
   Created)
Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 724; DB 14;
Pred. No. 4.9e-50;
6; Mismatches 53
                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        219
                                                                                                                                                 220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 14; Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                             æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       223
   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      53;
                                                                                                                                                                                                                                                                                                                             218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -GAQYGGISSRDQCDSFPAP 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 9
Q9JH91
                                                                                                                                                                                                                    ACCOMENTATION OF THE PROPERTY 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ŕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OCCOCK OCCCC OCCCOCCC OCCCC OCCCC OCCCOCCC OCCCCC OCCCCC OCCCCC OCCCCC OCCCCC O
S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S
                                                                              Matches
                                                                                                            Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
                                                                                                                                                                                                         EMBL; AB045172; BAA9B042.1; -.

HSSP; P43316; ZENG.

GO; GO:0008810; F:cellulase activity; IEA.

GO; GO:0005975; P:carbohydrate metabolism; IEA.

InterPro; IPR009009; Barwin like.
InterPro; IPR000334; Glyco hydro 45.

Pfam; PF00215; Glyco hydro 45; 1.

PROSITE; PS01140; GLYCOSYL HYDROL F45; 1.

SEQUENCE 219 AA; 23126 MW; A712EF3E3CAB041C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Obtoko K., Obkuma M., Moriya S., Kudo T.; "Diverse genes of family 45 cellulase homologues of the symbiotic protists in the hindgut of termite Reticulitermes speratus."; submitted (JUN-2000) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-OCT-2000 (TrEMBLrel. 15, Cr
01-OCT-2000 (TrEMBLrel. 15, La
01-OCT-2003 (TrEMBLrel. 25, La
Family 45 cellulase homologue.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                InterPro; IPR003009; Barwin like.
InterPro; IPR00334; Glyco hydro 45.
Pfam; PF02015; Glyco hydro 45; 1.
PROSTIE; PS01140; GLYCOSYL HYDROL F45; 1.
SEQUENCE 220 AA; 23274 MW; 26AF5357512EA061 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ohtoko K., Ohkuma M., Moriya S., Kudo T.;
"Diverse genes of family 45 cellulase homologues of the symbiotic
protists in the hindgut of termite Reticulitermes speratus.";
Submitted (JUN-2000) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A. Chtoko K., Ohkuma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Family 45 cellulase homounclassified eukaryotes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   unclassified eukaryotes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q9ЛН91;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        09JH91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; AB045179; BAA98049.1; -. HSSP; P43316; 2ENG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=42452;
[1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=42452;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GO:0008B10; F:cellulase activity; GO:0005975; P:carbohydrate metabo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         131,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 129
                                                                          130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11 LAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYAC--DANFQRLSDFNVQS
       11 LABALPIVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYAC--DANFQRLSDFNVQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   w
                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LQAGCQWRFDWFQNADNPSINFNQVTCPSELIARTNCKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LKPGCQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QVTNTGGDLGSNQFDLAIPGGGVGIYNGCTQQ-SGAPADGWGSRYGGVSSRSECSQLPSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLP----GAQYGGISSRDQCDSFPAP 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SCDGGDGYMCYDQAPWAVNDSVAYGFAAAACCGG-ETGACCNCYELTFTSGPVNGKKMVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LLFSLCLISWLVGDSGRTTRYNDCCKASCAWEKKAAVTQPVDTCGKDGTTRLASNDTVKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cellulase homologue.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       43.6%;
                                                                                                            42.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         30;
                                                                          28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Last sequence update)
Last annotation update)
                                                                      Score 709; DB
Pred. No. 7.7e
28; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 724;
Pred. No. 4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               metabolism;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            E
                                                                                                            DB 14;
.7e-49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 14;
.9e-50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IEA
                                                                              53,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                              Indels
```

œ

Gaps

4

180

121 128 62 89

뮍 S В Ś 닭 Ş 밁 8

8

Gaps

4

68

```
RESULT
Q9JH95
ID Q9
AC Q9
DT 01
DT 01
DT 01
DT 61
DT 61
DT 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT
Q9JH83
                                                                                                                                                                                                                                                                                              片
                                                                                                                                                                                                                                                                                                                                           $
                                                                                                                                                                                                                                                                                                                                                                                                          뭐
                                                                                                                                                                                                                                                                                                                                                                                                                                                 $
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VQ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AC OC COLOR REPORT OF THE PROPERTY OF THE PROP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Β̈́
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              γŞ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
09JH95;
01-OCT-2000 (TrEMBLrel. 15, Cr
01-OCT-2000 (TrEMBLrel. 25, La
01-OCT-2003 (TrEMBLrel. 25, La
Family 45 cellulase homologue.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GO; GO:0008810; F:cellulase activity; IBA.
GO:0005975; P:carbohydrate metabolism; IEA.
InterPro; IPR009099; Barwin like.
InterPro; IPR009099; Barwin like.
Ffam; PF02015; Glyco hydro 45; 1.
PR050116; GLYCO hydro 45; 1.
SEQUENCE 220 AA; 23108 MM; 97738D831BCFA5F3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       $1-OCT-2000 (TrEMBLrel. 15, Created)
$1-OCT-2000 (TrEMBLrel. 15, Last sequence update)
$01-OCT-2003 (TrEMBLrel. 25, Last annotation update)
$7-000 (TremBLrel. 25, Last sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         HSSP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ohtoko K., Ohkuma M., Moriya S., Kudo T.;
"Diverse genes of family 45 cellulase homologues of the symbiotic protists in the hindgut of termite Reticulitermes speratus."; Submitted (UUN-2000) to the EMBL/GenBank/DDBJ databases.
EMBL; AB045167; BAA98037.1; -.
EMBL; AB045166; BAA98036.1; -.
                                                                                                                                                     26HL60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         29ЛНВЗ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       09ЛН83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NCBI_TaxID=42452;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Eukaryota
                                                                                                                                                                                                        H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10
                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                 184
                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P43316;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                        VQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGTP----GAQYGGISSRDQCDSFPA 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCNGGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALIFTSGPVAGKTMVV 128
                                                                                                                                                                                                                                                                                                                            PLKPGCQWREDWFQWADNPTFTFQQVQCPAEIVARSGCKRN 224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SGCNGGSAYSCADQTPWAVNDNILAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LVFVFSLLASVLFGDSGKTTRYWDCCKGSCGWEAKADVSKPIDTCAKDGTTRVASNDTVK 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LAAALPLVASAASG-SGQSTRYMDCCKPSCAWPGKAAVSQPVYAC--DANFQRLSDFNVQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLP----GAQYGGISSRDQCDSFPAP 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LLFTLCLISWILGDSGRTTRYWDCCKASCAWEKKAAVTQPVDTCAKDGTTRVASNDTVKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGCDGCDGYMCYDQTPWGVNDSYALGFAAAAISGG-EKAACCNCYELTFTSGPVNGKKMT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCDGGEGYMCYDQAPWAVNDSVAYGFAAAACCGG-ESGACCNCYELTFTSGPVNGKKMVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               __KPGCQWREDWFQNADNPTETFQQVQCPAEIVARSGCKR
                                                                                                                                                                                                                                                                                              GLQAGCQWREDWFQNADNPSMNFNVVSCPSELIAKTNCRRN
                                                                                                                                                                                                                                                                                                                                                                                                       VQVTNTGGDLGSNQZDLAIPGGGVGIYNGCTAQ-SGAPADGWGSRYGGVSSRSECSQLPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EQAGCQWTEDWFQNADNPSINFNQVTCPSELTAKTNCKR 218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QVTNTGGDLGSNQFDLAIPGGGVGIYNGCTQQ-SGAPSDGWGSRYGGVSSRSECSQLPSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2ENG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   42.68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       32;
                                Last sequence update)
Last annotation update)
                                                                                            Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 706.5; DB 1
Pred. No. 1.2e-48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    220
                                                                                                                                                     ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                              220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
Q9JH86
                                Ś
                                                                                                                                                                                                        SO DO DE REPRESENTA DE COMPOSITORIO DE COMPOSI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뮍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   뭉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local S
Matches 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A. Ohtoko K., Ohkuma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sukaryota
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                unclassified eukaryotes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=42452;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=42452;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    unclassified eukaryotes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           125,
                                   15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      강
                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
  LPLYASAASGSGQSTRYMDCCKPSCAWPGKAAVSQPVYAC--DANFQRLSDFNVQSGCNG
                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
```

```
GO; GO:0008810; F:cellulase activity; IEA.
GO; GO:0005975; P:carbohydrate metabolism; IEA.
InterPro; IPR009099; Barwin like.
InterPro; IPR009034; Glyco-frydro_45.
Pfam; PF02015; Glyco-fydro_45; 1.
PROSITE; PS01140; GLYCOSYL_HYDROL_F45; 1.
SEQUENCE 219 AA; 23158 MW; ECD686EAB8ED1DD1 CEC64;
                                                                                                                                                                                                                                                                                 EMBL; AB045177; BAA98047.1; -. HSSP; P43316; ZENG.
GO; GO:0008810; F:cellulase ac
                                                                                                                                                                                                                                                                                                                                                                     Obtoko K., Ohkuma M., Moriya S., Kudo T.; "Diverse genes of family 45 cellulase homologues of the symbiotic profists in the hindgut of termite Reticulitermes speratus."; Submitted (JUN-2000) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q9JH86 PRELIMINARY; PRT; 219 AA.
Q9JH86;
Q1-OCT-2000 (TrEMBLrel. 15, Created)
Q1-OCT-2000 (TrEMBLrel. 15, Last sequence update)
Q1-OCT-2003 (TrEMBLrel. 25, Last annotation update)
Family 45 cellulase homologue.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         HSSP, P43316; 2ENG.
G0; G0:0008810; F:cellulase activity; IEA.
G0; G0:0005975; P:carbohydrate metabolism;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ohtoko K., Ohkuma M., Moriya S., Kudo T.;
"Diverse genes of family 45 cellulase homologues of the symbiotic protists in the hindgut of termite Reticultermes speratus."; Submitted (JUN-2000) to the EMBL/GenBank/DDBJ databases.
EMBL; AB045168; BAA98038.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro; IPR009009; Barwin like.
InterPro; IPR009334; Glyco_bydro_45.
Pfam; PPC2015; Glyco_bydro_45; 1.
PROSITE; 2501140; GLYCOSYL_HYDROL F45; 1.
SEQUENCE 217 AA; 22796 MW; 660DD1346B3769DB CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          18 VASAASGSGQSTRYMDCCKESCAWPGKAAVSQPVYAC--DANFQRLSDFNVQSGCNGGSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RFDWFQNADNPTFTFQQVQCPAEIVARSGCKRN 224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DLGSNQFDIAMPGGGVGIZNGCSSQFGGLP----GAQYGGISSRDQCDSFPAPLKPGCQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REDWEQNADNESMNENVVSCESELIAKTNCRRN 217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DLGSNQFDLAIPGGGVGIYNGCTAQ-SGAPADGWGSRYGGVSSRSECSQLPSGLQAGCQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMCYDQTPWGVNDSYALGFAAAAISGG-EKAACCNCYELTFTSGPVNGKKMTVQVTNTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMVVQSTSTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LASAFCDSGKTTRYWDCCKGSCGWEAKADVSKPIDTCAKDGTTRVASNDTVKSGCDGGDG
                        42.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     42.5%; Score 705; DB 14;
58.7%; Pred. No. 1.6e-48;
tive 33; Mismatches 47
   31;
Score 733; DB 14;
Pred. No. 2.3e-48;
31; Mismatches 51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 217;
                                                      Length 219;
      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
   ŝ
   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               99
   4:
```

```
RESULT 13
Q9JH87
ID Q9JH8
AC Q9H8
A
RESULT 14
C93783
ID 09378
AC 09378
DT 01-MA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ď,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                          닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           섫
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                          O93783; PRELIMINARY; O93783; 01-MAY-1999 (TXEMBLrel. 10, 01-MAY-1999 (TXEMBLrel. 10, 101-007-2003 (TXEMBLrel. 25, 101-007-2003 (TXEMBLrel. 25, 101-007-2003)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-0CT-2000 (
01-0CT-2000 (
01-0CT-2000 (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pfam; PF0
PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Obtoko K., Ohkuma M., Moriya S., Kudo T.;
"Diverse genes of family 45 cellulase homologues of the symbiotic protists in the hindgut of termite Reticulitermes speratus.";
Submitted (UUN-2000) to the EMBL/GenBank/DDBJ databases.
EMBL; AB045176; BAA98046.1; -.
HSSP; P43316; 2EMG.
   Humicola grisea var.
                                                                  Endoglucanase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GO; GO:0008810; F:cellulase activity; IEA.
GO; GO:0005975; P:carbohydrate metabolism;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=42452;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Family 45 cellulase homologue. unclassified eukaryotes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Eukaryota
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9JH87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                          184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ):0005975; F:Calcollin like.

Pro; IPR009009; Barwin like.

Pro; IPR009009; Barwin like.

Pro; IPR009034; Glyco hydro_45; 1.

PF02015; Glyco hydro_45; 1.

PS01140; GLYCOSYL HYDROL F45; 1.

T3; PS01140; GLYCOSYL HYDROL F45; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            r:
23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTMVVQSTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LAFISWSLADSGRTTRYWDCCKGSCGWEKKANVDKPIDTCAKDGTTRVASNDTVKSGCDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYAC--DANFQRLSDFNVQSGCNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CQWRFDWFQNADNPNINFSSVRCPAEIIAKINCNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CQWRFDWFQNADNPTFTFQQVQCPAEIVARSGCKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GEGYMCYDQTPWSVNDSYSYGFAAAACCGG-ESGACCGCYDLTFTSGPVNGKHMIVQITN 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSAYSCADQTPWAVNDNIAYGFAATSIAGGSESSWCCACYALTFTSGPVAGKTWVVQSTS
                                                                                                                                                                                                                                                                                                                                                                                                       CQWRFDWFQNADNPSINFSQVSCPSEIIAKTHCNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMREDMEQNADNPTFTEQQVQCPAEIVARSGCKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TGGDLGSNQFDLAIPGGGVGIYNGCTAQ-SGAPSDGWGSRYGGVSSRSECSQLPSGLQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GDGFMCYDQTPWQVSDSLSYGFAAAACCGG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TGGDLGSNQFDLAIPGGGVGIYNGCTAQ-SGAPSDGWGSRYGGVSSRSECSQLPSGLQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LTFVGLSLAESGKTTRYWDCCKGSCGWEKKANVDKPIDTCAKDGTTRVASNDTVKSGCDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence up)
(TrEMBLrel. 25, Last annotation)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
      thermoidea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              42.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34,
                                                                                                 Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 700; DB 1
Pred. No. 4e-48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sequence update
                                                                                                                                                                                                                                      227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           219
                                                                                                                                                                                                                                                                                                                                                                                                                                      ::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ESGACCGCYELTFTSGPVNGKKMVVQITN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 14;
                                                                                                                                                                                                                                      A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               49;
                                                                                                                                                                                                                                                                                                                                                                                                          218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GAOYGGISSRDQCDSFPAPLKPG 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              219;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               65
                                                                  RESULT 15

Q9JH9

AC QP

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SQ PROPERTY OF SQ PRO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  胺
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        믕
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches 137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local :
      Query Match
                                                                                                                                                                                                                                                                                                                                    EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          09JH90;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GO; GO:0008810; F:cellulase activity; IEA.
GO; GO:0008975; P:carbohydrate metabolism;
InterPro; IPR009909; Barwin like.
InterPro; IPR000934; Glyco-45.
Pfam; PF02015; Glyco-hydro-45; 1.
PROSITE; PS01140; GLYCOSYL-HYDROL F45; 1.
SEQUENCE 227 AA; 24240 MM; 873553E76F5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Takashima S., Iikura H., Nakamura A., Hidaka M., Masaki "Comparison of gene structures and enzymatic properties endoglucanases from Hunicola grisea.";
J. Biotechnol. 67:85-97(1999).
                                                                  GO; GO:0008810; F:cellulase activity; IEA.
GO; GO:0005975; P:carbohydrate metabolism; IEA.
InterPro; IPR009099; Barwin like.
InterPro; IPR009334; Glyco_hydro_45.
Pfam; PF02015; Glyco_hydro_45; 1.
PROSITE; PS00140; GIXTOSYL_HYDROL_F45; 1.
SEQUENCE 219 AA; 23037 WW; 37ZE016415530A9A CRC64;
                                                                                                                                                                                                                                                                                                                                                                    Obtook K., Ohkuma M., Moriya S., Kudo T.;
"Diverse genes of family 45 cellulase homologues of the symbiotic protists in the hindgut of termite Reticulitermes speratus.";
Submitted (JUN-2000) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Family 45 cellulase homologue. unclassified eukaryotes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-OCT-2000 (TEMBLrel. 15, Created)
01-OCT-2000 (TEMBLrel. 15, Last sequence update)
01-OCT-2003 (TEMBLrel. 25, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HSSP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; AB003108; BAA74957.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=IF09854;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=5528;
                                                                                                                                                                                                                                                                                                        HSSP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=42452;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=99144540; PubMed=9990729;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota; Fungi; Ascomycota; mitosporic Ascomycota; Humicola
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            244 TPTSTAPGSGQTSPGGGSGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 205 --LSLPPGTGQTM---GRSC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                124 IVQASNTGGDLGNNHFDIAMPGGGVGIFNACTDQYGAPPNGWGQRYGGISQRHECDAFPE
                                                                                                                                                                                                                                                                                                        AB045173; BAA98043.1;
P43316; 2ENG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           P43316; 2ENG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9 TTLAAALPLVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQRLSD-FNVQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PLKPGCQWRFDMFQNADNPTFTPQQVQCPABIVARSGCKRNDDSSFPVFTPPSGGNGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SGCN-GGSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTFISGPVAGKTW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KLKPGCYWRFDW-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VVQSTSTGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SGCDAGGGAYMCSDQSPWAVSDDLAYGWAAVNIAGSNERQWCCACYELTFTSGPVAGKRM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TILLILIPALAAAOSGSGRITRYWDCCKPSCAWPGKGPA--PVRTCDRWDNPLFDGGNTR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   42.1%;
52,7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HYDROL_F45; 1.
MF; 873553B76F5C39B4 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 698.5;
Pred. No. 5.5
          Score 698;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -CVS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                219
          Ed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .5e-48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IEA
      14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       46;
             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GAQYGGISSRDQCDSFPA 183
             219;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            H., Wozumi T.;
between two
```

243 183

204

123 126 63 67

227; 51;

Gaps

Search o	쓩	8	DЪ	8	Dδ	8	ф	γ	Best I Match
Search completed: July 7, 2004, 08:54:20 Job time : 46 secs	184 COMBEDWEQNADNPSINESNVKCPSEIJAKTNCNR 218	189 CCHREDWFQNADNFTFTFQQVQCFAEIVARSGCKR 223	125 TGGDLGSNQFDLAIPGGGVGIYNGCTAQ-SGAPSDGWGSRYGGVSSRSECSQLPSGLQAG 183	133 TGGDLGSNQFDIAMPGGGVGIFNGCSSQFGGLPGAQYGGISSRDQCDSFPAPLKPG 188	66 GTGFMCYDQTFMQVSDSLSYGFAAAACCGG-ESGACCGCYELTFTSGPVNGKKMIVQITN 124	73 GSAYSCADQTPWAVNDNLAYGFAATSIAGGSESSWCCACYALTETSGPVAGKTMVVQSTS 132	6 LTFIGLSLADSGKTTRYWDCCKGSCGWEKKANVDKFIJTCAKDGTTRVASNDTVKSGCDG 65	15 LPIVASAASGSGQSTRYWDCCKPSCAWPGKAAVSQPVYACDANFQRLSDFNVQSGCNG 72	Best Local Similarity 56.7%; Pred. No. 5.8e-48; Matches 122; Conservative 36; Mismatches 49; Indels 8; Gaps 4;